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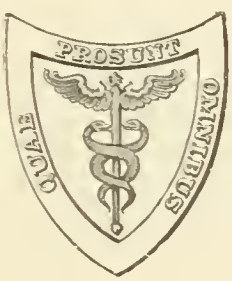


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# THE MEDICAL NEWS.

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## ORIGINAL ARTICLES.

### THE STRUGGLE OF THE BODY AGAINST TUBERCULOSIS AND ITS IMMUNIZATION.*

BY PROF. EDOARDO MARAGLIANO,
OF GENOA, ITALY.

I.

I WISH at first to express my hearty thanks to the committee of organization of the Congress, which, in asking me to hold the conference at the general assembly, has done me the honor to permit me to represent my country in its scientific aspect.

I would like to speak to you upon subjects relative to tuberculosis, and I have chosen that one to which for more than thirty years I have devoted, both in the laboratory and the clinic, the best efforts of my mind.

The existence of an antitoxin for tuberculosis and the possibility of its application to the cure of tuberculosis, was announced for the first time by me in Bordeaux, in 1895. The truth which I announced was the object of many discussions; it is, however, thanks to the successive labors of many savants, a definite addition to science. Many workers in laboratories, among others, Behring and Arloing, have verified the possibility of obtaining a true tuberculous antitoxin from animals, and a host of physicians have recognized its practical application in the treatment of human tuberculosis, and its efficacy when the disease is in a stage that is not too far advanced.

To-day I wish to call your attention to a problem of a higher order even than that of the cure of tuberculosis, and to speak to you of the natural means that the body possesses and employs to combat this disease, and of the means by which one can create in it an artificial immunity against tuberculosis.

This is the problem which for some years has held my attention and on which I propose to speak, pointing out in this thesis the results that have thus far been obtained.

I must, in the first place, tell you that these results are the fruit of the labors, not only of one person, but of a school. They are, in fact, the experimental and clinical researches publicly carried on, either in my Medical Clinic or in the Institute for the Study of Infectious Diseases which I founded and where a band of eager workers find at their disposal all necessary material for their research work, observation, and experiments.

There is a fact that always gives food for reflection to those who are interested in tuberculosis; viz., in spite of the enormous diffusion of the tubercle bacillus in the midst of cities, a great many persons remain unaffected by the terrible disease.

Experimental pathology, it is true, has demonstrated that no absolute immunity exists, if very large quantities of a virulent culture be introduced into the body. But to carry this proposition into actual practice is not permissible. Is it not just, on the other hand, to state that never does one verify in spontaneous infections what happens in those that are experimentally induced, where one injects into the veins large quantities of the tubercle bacillus?

For the number of pathogenic micro-organisms introduced at one time, and the avenues of entrance are two factors by no means to be neglected in the induction of an infectious process. The blood offers, as is well known, the most favorable means for a rapid diffusion of the bacillus.

This is the reason why, in spite of the possibility of artificially infecting any organism whatsoever, it is proved by experience that it is no less true, that a great many persons exposed to the tubercle bacillus remain free from infection, and that we physicians ought to recognize clinically and practically, the existence of a certain class of persons possessing a natural immunity towards tuberculosis, such as we would like to establish in the human body.

In view of the facts we must ask ourselves why this immunity is possessed by some, and does not exist for others, and by what circumstances it can be strengthened or made to disappear. It is to the study of this problem that my coworkers and I have directed our attention.

I will first tell you what was our point of departure. We ought, in the study of the pathology of the products of disease caused by tuberculous infection—as in that of the greater number of infectious diseases—consider on the one hand the tuberculous poisons created by the changes in the tissues and the plasma of the body, and on the other the bacillus that produces these poisons.

Tuberculous poisons have a double origin, a part are the secretions of the bacillus during its period of biological activity; the others are enclosed in the protoplasm of their own bodies. These latter are of special importance, as the dead bacilli can create in the tissues similar changes to those created by the active and living bacilli; and it is just by means of these latter poisons that the dead bacilli exercise such power.

Their poison, as I have been able to demonstrate by a series of researches already well known, and of which I gave a full account to the French Congress on Tuberculosis, in Paris, in 1898, can be completely withdrawn from the

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bodies of the bacilli, by a prolonged boiling in water. They show a pathogenic and necrotic power over the tissues with which they come in contact.

Among our researches, I will mention particularly those of one of my associates, Dr. Badano, who has demonstrated that the poisons of the bodies of the bacilli injected into the trachea cause the development of areas of bronchopneumonia in the lungs of animals.

To be able to defend itself victoriously against the attacks of the tubercle bacillus, it is necessary that the body should, at the same time, neutralize the tuberculous poisons, prevent the multiplication of the bacilli, and destroy those that have already found their way into the organism.

I place, as of first importance, the neutralizations of the tuberculous poisons, expecting that if this condition is not met, these poisons, by altering the character of the tissues, will create a soil still more favorable for the development of the bacillus.

We have proved this by a very simple experiment. When one injects into the thigh of a guinea-pig a small quantity of tuberculous poisons, $^1/_{10}$ c.cm., and if one inoculates the animal at the same time with a small dose of an active and virulent culture, the bacillus infection proceeds much more rapidly in the infected animal than in the controls.

Does an organism in a good physiological condition possess a means of defense against tuberculosis?

In order to answer this question, we have resource to a series of researches intended to show whether the sera of different animals do or do not contain antitoxic materials that neutralize the tuberculous poisons. These fundamental researches were only made possible by my work upon tuberculous poisons.

In short, I found myself balked at the beginning of my studies with an inactive principle with which it would have been impossible to kill the healthy guinea-pig, by means of these poisons. I used at that time a product that was inconstant in its nature, vacillating in its toxic quality, and imperfectly specific; varying because the richness in toxic material is variable from one culture to another, imperfectly specific because the 50 per cent. glycerin contained in the tuberculin modified its specific character, the glycerin being in itself a toxic product. But we succeeded by our studies in providing ourselves with a product whose dose was constant, having 100 toxic units to the cubic centimeter; that is to say, in a cubic centimeter a subcutaneous injection would surely kill a guinea-pig weighing 100 grams.

Having thus reduced the power of killing to an exact art, for we possessed a sure specific poison, and an exact method of dosage, it now remained to see whether the serum of man and of animals would have any neutralizing power when used in the guinea-pig; and if so to calculate exactly the antitoxic value of the different sera.

These experiments have shown us that the serum of robust and healthy men, contains positively defensive elements, for a dose of tuberculous poison that would be surely fatal in a guinea-pig is no longer so, when it is first mixed with a certain quantity of human serum. In repeating the experiments with the serums of different healthy animals, we have found that some do, and others do not, possess this antitoxic property; we find that human serum stands the highest in the scale of antitoxic power. That of the cow, calf, dog, cat, stag, horse, and above all of the turkey and the pig also contain antitoxic elements in different proportions. There is, however, no trace of them in the sera of the guinea-pig and rabbit.

Relative to the bacilli we have found that the same sera of healthy subjects if added in different proportions to the cultures were capable of influencing their development, and we have really found that several of them exercised a very decided influence, and have prevented the development of the bacilli.

The most powerful sera are those of the man, of the pig and the calf, then come those of the cow, the horse, the dog, the ass, the stag, and the rabbit, while the power of that of the guinea-pig is reduced to zero. The bacillus of tuberculosis may be even cultivated with ease in the pure serum of the guinea-pig.

The sera of the animals just mentioned, are endowed with still another property, that of agglutinating homogeneous cultures of the tubercle bacillus, according to the methods of Arloing and Courmont, which is the surest. This fact, affirmed by Arloing and Courmont, has been clearly confirmed by my own researches. The sera of the horse, the ass, the stag, the sheep, the dog, and the rabbit all possess a certain power, more or less marked, of agglutination. That of the guinea-pig, on the contrary, does not as a rule, possess it at all.

Agglutination, it is useless to call it in question, is the expression of a process of immunization, of a special defensive energy of the organism, as I have understood from the publication of the works of Widal on agglutination in typhoid fevers, a phenomenon which the author interprets as a reaction to infection.

Tuberculosis does not escape this law, which is to-day universally admitted. Koch himself expressed the opinion that agglutination in tuberculosis would be the exponent of the immunizing reaction. This phenomenon is, in fact, related to the presence in the circulation of substances that exercise a particular action on the bacillus of tuberculosis.

The agglutinating power is thus a new proof of the existence of defensive materials in animals. The serum of a healthy man, showing no actual sign of tuberculosis also possesses a certain power of agglutination. This last proposition, affirmed first by Arloing has been confirmed by our own experiments, in our Institute, and by those of Romberg, at Marburg.

But in addition to these energies that the animal organization usually possesses to defend itself against tuberculosis, there exist others whose existence is induced by the presence of the bacilli and their poisons. These are represented —as I can affirm after a long series of experiments undertaken for several years, on different animals, and published in 1895, and continued to this day—by the extraordinary production of antitoxins, by bacteriolysins and agglutinins.

If one determines, according to my method, the antitoxic power of the blood of an animal, as opposed to tuberculous poisons, and then inoculates it methodically with small quantities of these poisons, one sees, at the end of a certain time, that the antitoxic power of its serum increases considerably. We have verified this fact in the dog, the ass, the horse, the stag, the sheep, the cow, and last, in man. This increment of antitoxic power, which may be perceived at the end of a month, becomes considerably greater, so much so, that in several horses that started with only 100 to 200 antitoxic units to the centimeter, the increase amount progressively to 1,000, 2,000, 4,000, and 8,000. I have established the fact that in a healthy man, at the end of a month of regular inoculations, the antitoxic units can be raised to double or triple the amount of those at the beginning of the treatment. This ability of the human organism to produce, as a defensive reaction against tuberculous poisons, defensive antitoxic elements, is a fact that is to-day universally admitted. Perhaps it has not been forgotten that I was the first to demonstrate it, at a time when the possibility of obtaining a tuberculous antitoxin was not even suspected.

What I stated for the first time in the month of August, 1895, in Bordeaux and London, was confirmed by numerous observers, among whom was Behring, who repeated it in several communications, notably in that to the Congress of Hygiene in Madrid, 1898.

And if some few observers failed to obtain the same results, it was the fault of technical errors arising largely from the use of glycerinized tuberculin. It happened in some instances that the experimenters injected into their guinea-pig along with the tuberculous poisons, toxic quantities of glycerin, which destroyed the value of their results.

The introduction of the bacteria into the organism stimulates in the same way the development of these new bactericidal energies. It was evident when an animal was injected with my aqueous tuberculin—which was nothing more than aqueous extract of the bodies of the bacilli —that this development was really an inoculation of dried or living bacilli. The latter particularly when they are prepared in a convenient form, start up in the inoculated animals, a formation of substances that are strongly bactericidal.

This may be proved in different ways. The blood of different animals is collected, and is tested to see whether the living virulent bacilli lose their vitality from contact with serum that is suitably prepared. The object of the research in such cases, is to see, whether, and in what proportions, the sera added to the culture modify the development, whether the bacilli once brought in contact with the sera, can thereafter develop regularly. In short, whether the bacilli, after coming in contact with the sera for a greater or lesser time show any of those necrobiotic changes that are characteristic of their death and destruction as studied in my Institute. By all these experiments we have been able to prove that the sera of all animals treated with different tuberculous materials, possess to a greater or less degree, a baneful action upon the bacilli of tuberculosis.

The first series of experiments show clearly that the bactericidal action is due to substances developed in the animal that furnished the serum that contained them in solution. It deals with a destruction of the bacilli, that has nothing in common with other organic energies, such as those presented by the phagocytes, and other tissue elements.

This does not, however, prevent me from admitting the rôle that the leucocytes and the organic elements may play in the formation of these substances, also the destruction that the leucocytes and these cellular elements exercise on the tubercle bacilli; but I maintain simply the undeniable fact that in the serum of inoculated animals there is found, as I have said, certain substances in solution that are capable of nullifying the vitality of the bacilli, and causing their destruction.

In connection with the second series of experiments we studied the power that the serum had of depriving the tubercle bacilli of their infectious properties. In order to demonstrate this fact we inoculated guinea-pigs with virulent bacilli that had been kept in contact with the serum for a varying length of time and after preparing controls waited for the development of the infection. We succeeded by these methods in preventing the development of tuberculosis in guinea-pigs, after an injection of very virulent bacilli, which caused certain infection in the controls.

But I would like to describe still another more striking experiment. We inoculated the peritoneum of a guinea-pig with a certain amount of virulent and active culture, mixed with the suitably prepared serum of a horse. After which, at the end of twenty-four to thirty-six hours, we opened the peritoneal cavity and collected a certain amount of the liquid containing the inoculated bacilli, and used them for the new peritoneal inoculations and to sow the culture tubes. These remained sterile; and as to the inoculated animals they did not take the disease.

The experiences of the controls, however, those that were inoculated but without the addition of the serum, gave positive results.

The dried bodies of the bacilli, and particularly the living bacilli, constitute the material that is the most likely to create in the organism a large quantity of specific bactericidal substance. Viru-

lent cultures of tubercle bacilli injected into the veins of rabbits, along with the serum, remained inert, but there was found a formation both of bactericidal substance and agglutinating materials. Horses, asses, cows, sheep, stags, dogs, rabbits, treated as we have described, have attained a power of agglutinization in the proportion of 1 to 400: as for example, in a cow inoculated with the dead bodies of bacilli. This very significant increase in the power of agglutination proves with certainty the development, in great quantity, of protective bodies in the organism of animals treated by means of dried bacilli, or those that are living and active.

By comparing the agglutinating power of the serum in animals inoculated with tuberculous poisons, with that of animals treated with the bodies of the bacilli, we have found that the agglutinizing power is much stronger in the second case, while the antitoxic power shows itself much more intensely in the animals submitted to injections of poisons.

These experiments tend to show that in the animal organism tuberculous poisons incite the formation of antitoxins, and that it is the bacilli that give rise to the development of these antibodies, making up a highly defensive sum of energies.

We also undertook a series of researches to study the fate of the active living bacteria when they were inoculated under the skin of animals. By a very simple technic, we periodically probed the place of inoculation, and took away small quantities of subcutaneous material, and we were thus able to follow, with the microscope the morphological modifications of the inoculated bacilli, whose fate it is to be little by little swallowed up by the leucocytes, and to undergo, during a greater or less length of time, various phases of necrobiosis, and at last to disappear completely.

Of all the animals on which we have made the experiments, dogs, asses, rabbits, guinea-pigs and rats, the dog seems to be the one in which the destruction of the inoculated bacilli takes place most rapidly; at the end of five days these latter were to a large extent swallowed by the leucocytes, and in a state of complete bacteriolysis, while in the guinea-pig at the end of the same length of time, not only were the bacilli not yet devoured, but they presented almost the same characteristics as they had done in the culture.

At the same time, bacilli injected in small quantities directly into the lung of a healthy rabbit are doomed to destruction. It is thus proved in the most positive manner by our experimental researches, that there are defensive remedies against tuberculosis: one is represented by the natural energies of the healthy body, which is able to defend itself efficaciously against the bacillus of tuberculosis and its poisons; the other comprises the new energies which we see rushing forth when the bacilli or their poisons penetrate the organism.

Would these defensive energies which are found physiologically in the body be the effect of reactions produced by latent tuberculous infections of the past that have been ignored? Or might they rather be congenital energies? Or still, might they not be the result of a unique genetic mechanism?

But let us set aside, for the time being, such questions which would lead us into many discussions, and content ourselves at present with knowing that the organism can have no hope of victory in the struggle against tuberculosis, outside of these two classes of defensive energy. So long as these preserve their integrity, the bacilli are destroyed as soo as they enter the organism, and their poisons neutralized, without there being any tangible sign to warn us of the struggle that is going on in its various phases of development, in a certain local circumscribed portion of the body. I have seen a guinea-pig, the animal that is poorest in defensive energies, resist the hypodermic inoculation of small doses of virulent bacilli, and continue to keep well, and even to increase in weight.

But let us suppose that the defensive energies, those that are normal above all, are not quite complete, there is then established a local focus of tuberculosis, and then there develops by an effect of reaction toward this focus, and toward the bacilli that were multiplying and the poisons that they elaborated, reactive energies, and specific means of defense. The bacilli are destroyed, their poisons are neutralized and a spontaneous cure takes place without any other special intervention, and proclaims the victory of the organism over tuberculous infection.

The defensive powers which depend primarily upon conditions of organic soil, tend to disappear when a change in the condition of the soil arises.

I have been able to convince myself, by a series of experiments on individuals weakened by preceding illness, and on subjects whose nutrition was interfered with, either by excessive fatigue, or by insufficient food, that their serum did not possess enough of the materials of organic defense, that is to say that the neutralizing action toward the tuberculous poisons and the inhibiting action toward the bacilli were not up to the standard.

Therefore I have also stated that the defensive resources of the organism of individuals cured spontaneously of tuberculosis, exactly measured according to my method, increases proportionately according to the degree by which they approach complete cure; and that the presence and the proportion of defensive elements in the body keep pace with the variations of the malady as it progresses towards or away from cure.

These experimental researches only go to confirm what the clinical observations have brought into prominence concerning the particular fatality with which tuberculosis attacks women who are pregnant, or in puerperal condition, or who are nursing. These conditions of organic soil differ in various degrees with each subject.

In reckoning the numbers of bacilli contained

in the inoculating fluid we have inoculated 100 guinea-pigs, and 100 rabbits with exactly determined quantities of the tubercle bacilli. We have been able to determine that 10 bacilli could by themselves produce a generalized tuberculosis in certain subjects, while in others the injection of 500 bacilli remained without effect. These differences in results are not possible, unless one takes into account the slight number of bacteria employed, seeing that 500 is but a trifle in the world of infinitely small things. I note this circumstance because, as I have said, there are no organisms that could withstand the direct inoculation of a very strong dose of tubercle bacilli.

The defensive power, moreover, is not even the same in all the other tissues, as I have been convinced by a very interesting series of experiments. When one injects into the veins of a dog, a gram of virulent tubercle bacilli these become localized in the lungs, and create tuberculous foci, which are forthwith spontaneously cured, and in which at the end of a month one can find no trace of the bacilli. On the other hand, in injecting the same quantity of bacilli into the peritoneum, one finds at the end of a month a well-developed tuberculous peritonitis, and we can easily distinguish between the bacilli in the veins and those in the peritoneum, those in the peritoneum growing and thriving, while the others succumb to their fate in the lung. These conditions of organic soil ought to be considered to a great extent, as acquired, and we ought to consider them in connection with the hygienic conditions in the midst of which the organisms live. The condition of nutrition ought to have first importance and our researches explain the reason perfectly.

Among the conditions of nutrition which create and augment the defensive powers, I will cite the use of alcohol. But, take care, I warn you, I speak of the moderate use of this substance, and not of its abuse which creates on the contrary a diminution of resistance in the body. For I have observed that the very healthy subjects which show the richest defensive material in the blood, without having the clinical signs of chronic alcoholism, have, however, been accustomed rather largely to alcoholic drinks.

From the combined results of our experimental researches, we have been able to get an exact idea of the manner in which the animal organism struggles, or can struggle against tuberculosis, and the weapons with which nature has furnished it to triumph over it enemies. We ought, therefore, to recognize the fact that the best means of fighting against the propagation of tuberculosis is to increase as much as possible the natural defensive forces of the body. Toward this end we have directed all our efforts, all our work and our whole energy. But, gentlemen, we must state that it is not the sanitarium alone that will succeed in diminishing the number of victims of tuberculosis, and protect humanity from its scourge. The sanitarium will not stamp this evil off the earth.

True, I do not doubt that sanitaria constitute a very highly humane source of help to the tuberculous poor, and lend their aid to cure when that is possible, but sanitaria can play no decisive and important rôle in the social prophylaxis of the disease, and they seem to me, looked at from this point of view, more like sanitary cordons and quarantine stations, rather than means of preventing the spread of epidemics.

To create good hygienic environment in the country, and to suppress at the same time all soil suitable to the growth of these germs of disease, according to experience and to science this is the most efficient way to stem the tide of infection. When in a future that is more or less near, our efforts will have succeeded in strengthening the organic soil, and in furnishing it with specific energies that will serve to immunize it against infection, tuberculosis will be vanquished.

II.

Can we hope to see the dawn of this day. I have turned my attention and my studies especially toward this point and will tell you what work has been accomplished if you will have the kindness to follow me a little longer.

The first problem to solve was naturally the immunization of an animal against tuberculous infection, so that autoimmunization in him might be accomplished. This difficulty has been overcome in part. In 1895, in my reference at the Congress of Internal Medicine at Bordeaux, on the serum therapy of tuberculosis, I distinctly announced on the twelfth of August that the animals that furnished me the antituberculous serum, were immune. I did not insist on this, although I expressed myself very explicitly. For chronological reasons, however, it will be as well to revert to it. I declared in this connection that I had rendered immune dogs, asses and horses, and apropos of dogs, I said exactly the following words, which may be found on page 1080 of the official report of the Congress at Bordeaux. *"Progressive vaccinations, according to the methods that I have followed, immunize dogs against the injection of very virile human tuberculosis in their veins."*

These words were spoken by me, as I now recall it, on August 12, 1895. I have continued my experiments in this line, and to-day I can tell you that my animals are still immune. In my Institute are cows, asses, sheep and dogs that are completely immune, some for as long as five years; and I have even succeeded in immunizing rabbits.

I have rabbits which we have inoculated with no effect, with active virulent cultures of human tuberculosis, that killed the controls in from twenty to thirty days.

The possibility of immunizing animals, announced first by me in 1895, was announced anew toward the end of 1902, and in the month of March, 1903, by Behring at Vienna. I was delighed that so eminent an observer had confirmed in the calf what I had affirmed eight years previous, viz., the possibility of vaccinating and im-

munizing animals against tuberculosis, but I hold, as is very natural, that the fact should be recognized that I attained the same results several years before he did.

The vaccination and this immunization may be obtained in different ways and with materials of different kinds. We have succeeded in using materials taken from very active cultures, from dead and dried bacilli, from living and very virulent bacilli, and from an extract of active living bacilli. This extract manufactured by a cold method, without the use of heat or chemical substances is the one by which we have been able to obtain the largest amount of immunizing energy, without running any risk of creating tuberculous infection in the inoculated animal. By means of this process immunization takes place very quickly, and to use it, it is only necessary to resort to intravenous injections.

But setting aside for the time being the method of using it, it is sufficient to say that one can immunize an animal against tuberculosis, and render it impervious to the disease, even so that one can permit a larger quantity of bacilli than one would think possible to enter the tissues and to circulate in the human blood, following the usual conditions in which infection is produced.

In view of these facts it is natural to ask a question that implies another hope. Is it possible to cause by any feasible method such immunization in man?

I have studied the problem from two different points of view, and I have approached from two different avenues. There is the point of view of passive immunization, and that of active immunization.

One may, as is known, bring about passive immunization against infection in an animal, by introducing into its body defensive materials produced in the body of another animal that is immune to this infection. For this the serum of an immune animal is used. As this method was employed for cowpox, tetanus, diphtheria, and other infections, we have tested its value for tuberculosis. We have submitted our animals to injections of serum from immune animals, and have developed considerable antitoxic power in their blood, at the same time we uphold the evident action of new serum, on the vitality of the bacilli, and the resistance of the animals to the intravenous injections of virulent bacilli.

Tubercle bacilli introduced beneath the skin of those animals immunized by the serum were destroyed with singular rapidity.

We have made the same experiments with injections in a healthy man. Naturally it is not possible for us to verify their efficacy by means of the virulent bacilli test, as in animals. For this reason we have resorted to different criteria, that is to say to investigations upon the antitoxic action, and the agglutinating power. We have found that our treatment was followed by a considerable increase of agglutinating power (some samples showing as high as 1 to 30 or 1 to 50) as well as of antitoxic power: otherwise the blood of these individuals affected the vitality of the bacilli.

We have also proof that injections of serum of immune animals into a healthy man cause the appearance in his body of specific elements of defense, of high degree, which furnishes us a very plausible reason for thinking that we have by these means, furnished our subject with defensive and immunizing materials.

We have had some direct proof with individuals suffering from pulmonary tuberculosis. A tuberculous patient is really comparable to an animal inoculated with tuberculosis, as the one as well as the other has bacilli in its body; in the one infection is caused by ambient conditions, in the other by the experimenter. We have injected the serum of immune animals into a man that was undoubtedly tuberculous, and at the same time that we caused the arrest of the tuberculous processes we developed in him defensive materials which we could measure exactly according to my method.

In the subjects that I have cured in a lasting manner the serum has evidently played the rôle of immunization along with its therapeutic action, for if not we would soon have seen a reinfection established in an organic soil that had lost its defensive powers, or the capacity to produce them. This is a fact toward which we have not yet directed our attention, but which, however, deserves to be seriously taken into consideration. For, owing to the great diffusion of the bacilli of tuberculosis, it must be admitted that when a subject cured of tuberculosis does not take necessary precautions, the possibility of his not contracting a new infection can only depend upon a modification of the organic soil which had become refractory to tuberculosis. Otherwise reinfection would be inevitable. We know several such individuals, treated with serum injections, who have been cured of tuberculosis for ten years, and who come from time to time to be under the control of our clinic.

The number of patients treated with the serum of immune animals and those of physicians who have in some degree applied this treatment to their clients, and continue to use it, is already so large that it is impossible to give complete statistics. But all the physicians who have inoculated tuberculous patients with the serum of immune animals have some cases that have been immune for several years. We, therefore, feel that we are right in admitting that injections of the serum of immune animals can develop in man a certain degree of immunity.

As a striking instance of this I will quote the case of a tuberculous family under my observation in the Polyclinic.

In the family, the mother who is a healthy woman, had a brother and two sisters who died of tuberculosis. The relatives of the father were healthy. Twelve children were born of this union, of which one died at the age of three, of diphtheria. All the other eleven were tuberculous, four dying before the family came to my

clinic. The remaining seven children who showed different degrees of pulmonary tuberculosis were treated by means of progressive antitoxin injections; that is to say they were possibly rendered immune. To-day they are in excellent health and have no symptoms of any trouble in the respiratory tracts. Their immunity has lasted for ten years, during which time they have been obliged to work under miserable hygienic conditions, and to be exposed to the weather. Their case is significant on account of the number of sick ones in the family to which they belonged.

Another method of passive immunization consists in introducing the defensive materials contained in the serum directly into the digestive tract, instead of injecting them directly into the body.

This method has not yet received the approval of all investigators, who hold that the defensive materials are altered and not assimilated in the gastro-intestinal tract. Setting aside all the doctrinal wisdom invoked to uphold this view, it is a fact that for certain infections the introduction of defensive materials into the stomach is possible. Sclavo, an investigator and experimenter of high renown, has proved this for diphtheritic antitoxins, and Mercatelli for the pest vaccine.

In my Institution and clinic, we have carried on such researches for five years, and have announced in preliminary reports what we can now affirm, viz., that we have verified in man as well as animals, what Sclavo observed for diphtheria. The immunizing materials pass into the circulation and have an analogous action to that of the serum injections.

We have in our Institute some rabbits that were fed on certain quantities of blood taken from immune animals and that after a month showed to a high degree both antitoxin and agglutinating power.

Behring recently expressed his hope, in Vienna, that it might be possible to immunize animals by feeding them with the milk of cows immune to tuberculosis, and announced that he was going to make investigations to see whether the antituberculous material passed into the milk and could be assimilated by those who drank it. We have studied this question before him. We can state on the one hand that the defensive materials of the cow that is immune to tuberculosis do pass into the milk, but in small quantities only, but on the other hand that these materials, as I have just said, when introduced into the digestive tract are absorbed and exert a protective action in the organism of animals, and even of adult men. Also, it is quite possible that these immunizing materials get into the human body by means of milk.

But my spirit is burdened with the desire to attain even a higher end, viz., the artificial creation of active immunization in man, his vaccination against tuberculosis, just as it is practised for smallpox, in such a way that it will cause autoimmunization. For active immunizations are preferable to passive ones, as they cause the organism to play a much greater part in the process of immunization; and its reaction to the contact of morbid elements created by the defensive materials is more stable and lasting in the human organism.

I have examined the question from the clinical standpoint, and I have studied it experimentally. From the clinical standpoint I will call your attention to an important fact that deserves serious examination. When a man develops in any part of his body whatsoever a localized focus of tuberculosis, if this focus heals the man remains, as a rule, immune to tuberculosis. It is rare, for example to see any other tuberculous focus appear; after a surgical operation for tuberculosis is performed. In families in which tuberculosis is prevalent we see subjects that have been cured of tuberculous arthropathies living in a very good state of health. Those who listen to me will be convinced of this if they but call to mind cases in their own clientele. They will find it the same for those who have suffered from cutaneous tuberculosis. These cases of external tuberculosis are very valuable for our demonstration, for they lend themselves to exact diagnosis and to exact establishment of complete cure, for, of course, cure must be complete if the case is to be of real value.

But one may also observe similar cases in visceral tuberculosis. There are many patients who have had attacks of peritoneal tuberculosis and who once cured have never had another focus of tuberculosis. The same observation holds good for tuberculosis of the pleura and lungs.

When a person is surely and completely cured of a pulmonary tuberculous focus, with the formation of a sclerotic tract in the area of a previous infection, he generally remains thereafter permanently unsusceptible to tuberculosis.

Similar facts which we obtain from the clinical histories show us that tuberculous subjects may after complete cure, remain immune against tuberculosis. I say immune, for as I have said before, as I like often to repeat, an organic soil that has once contracted tuberculosis, must necessarily be exposed to new infection if it does not undergo a (complete) transformation.

This clinical consensus and the positive fact that I demonstrated eight years ago, and have confirmed by successive work, viz., the possibility of definitely and surely immunizing animals against tuberculosis, have formed the starting point of my studies on the vaccination of men.

I have first outlined in my method all processes of immunization founded on the inoculation of any kind whatever, of living bacilli in the organism. Injections of cultures in the veins, however attenuated—such as employed by Behring for calves could never be used for man. And it is false that active immunization is only possible by means of injections of living cultures. According to this maxim that Behring has recently pronounced we would be forced from the start

to preclude all possibility of obtaining auto-immunization in man.

But, happily, I believe that it will be possible to obtain this result by means of inoffensive treatment. The first proofs of active immunization in man were furnished to me by the injections of tuberculous poisons.

I have already spoken to you of these experiments. In a healthy man these injections cause the formation of antitoxins, and of agglutinizing materials, and correspond exactly to the effect that Koch noted recently, in connection with the immunizing action of injections of tuberculin in man. As long ago as 1891, apropos of the old tuberculin, I maintained that its action might, perhaps, bear some relation to the production of defensive materials in the blood; and my successive experiments, as well as those of a great many observers, have proved the truth of this assertion.

In some tuberculous patients, after having effected a cure by means of the serum of immune animals, I have practised successively injections of tuberculin and serum, then only tuberculin, and have obtained confirmatory results. For subjects treated in this way do not show, at the end of seven years any sign of tuberculosis, and continue to keep well, although living always in their habitual ways. Among others is a physician who continues to follow his profession, which exposes him continually to new infection.

I have wished, however, to produce immunization in another way, and I am applying myself to the solution of the following problem: How to obtain immunization by producing a circumscribed focus of tuberculosis on the surface of the body.

The principal difficulty consists in choosing a suitable material for immunization, for the point is to obtain everything that pertains to living bacteria without using the living bacteria themselves; we must, in short, find a material of inoculation with which there would be not even the most remote possible danger of causing tuberculous infection.

After many trials and experiments I have succeeded at last in preparing a material, which, all danger of infection excluded—will cause, when inoculated under the skin, a tuberculous phlegmon. By means of these inoculations, we possess the possibility of establishing the production of immunizing resources in animals. For, naturally, it is on animals that we have made our first experiments of immunization according to the new method.

I can state to you now, that the inoculations have determined the production of antitoxic, bacteriolytic and agglutinating materials, and have immunized my animals to the point of rendering them insensible to intravenous injections of virulent cultures that inevitably killed the controls, as I was able to prove even for rabbits.

Being convinced, gentlemen, that the treatment is innocuous, I have begun to use it on men. It is clear that in their cases, we cannot practise crucial experiments as we do for animals, that is to say, the injection into the veins of virulent cultures of bacilli in order to get incontestable proof of their immunity. But the blood of subjects thus treated, has acquired a high degree of agglutinizing power, and at the same time an abundant leucocytosis has resulted; that is to say, the blood of man has shown the same modifications as that of animals.

I have made these inoculations on one of the limbs, settling at last definitely upon the arm. At the point of injection there appears a development of a small circumscribed area of tuberculous ulcer with suppuration that is entirely sterile; the temperature runs a fever course for two or three days as a rule; and then everything is over.

This, gentlemen, is what I have done along this line.

Certainly the road along which we must travel is still long; but after all that I have seen with my own eyes, I have the right to be convinced that if we can render animals immune, we can in the future render man immune. I wish that there might still remain for me enough of life to see this conquest of science brought to an end; but the way is open, and by me or by others, the end will be obtained.

A vision of this day is clearly pictured in my thoughts, and it will be remembered in future that it was to the friendly hospitality of Spain, in her beautiful capital, Madrid, that the dawn was announced.

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## TUBERCULOSIS IN THE TENEMENTS; A NEW USE FOR FIRE-ESCAPES.

BY ALFRED MEYER, M.D.,
OF NEW YORK:
ATTENDING PHYSICIAN MOUNT SINAI HOSPITAL.

The outrageous insinuations made by Lady Mary Wortley Montague against the medical profession in 1717 surely would be impossible to-day. She wrote at that time regarding a useful remedy for a prevailing epidemic: "I should not fail to write to some of the doctors very particularly about it, if I knew any of them that I thought had virtue enough to destroy such a considerable branch of their revenue for the good of mankind. But that distemper is too beneficial to them not to expose to all their resentment the hardy wight that should undertake to put an end to it."

Everybody who is familiar with the world's antituberculosis work of the past few years knows how large has been the share of physicians in the attempt to limit the spread of the disease, and, if possible, to wipe it out from the category of human ailments. It is due to the initiative of medical men that in nearly every civilized land of the world, sanatoria have been established in increasing numbers for the cure and sanitary education of those suffering from pulmonary tuberculosis; the propaganda for state and municipal aid has been kept up by them, they have served on committees for kings and governors without compen-

sation, to further the good work; and they have pointed with pride to the gradual but steady reduction in the death-rate from this disease.

In New York City there was a reduction of 10 per cent. last year in spite of the increase of population. It would be hard to find a more splendid

Pulmonary Tuberculosis Successfully Treated on the Fire-Escape of a New York Tenement House. Near View.

example of altruistic effort, and the sneers of Lady Montague would be strikingly out of place to-day. Yet the vastness of the numbers to be provided for in sanatoria has always been a great obstacle in the work; and another difficulty has been the overestimation of the value of particular climates and altitudes, and the underestimation of fresh air *per se;* the overestimation of the value of medicines and the underestimation of the value of light, food, invigorating baths, sponging and continual medical supervision. In recent years, however, the eyes of the medical profession have been gradually opened to the truth that a large proportion of cures may be effected without expatriation, without exhausting journeys, without great traveling expense, without breaking up of families, without a complete isolation from those who are dear, without the brooding home-sickness that comes with the rupture of domestic ties and banishment to distant lands and strangers. And the corollary of this position is the one that finally each country can solve its own tuberculosis problem at home,—this being true even of the smaller political units, such as counties and cities.

Now, in New York city we have a feature in tenement-house construction which appears to me to open up very large possibilities for the successful outdoor treatment of pulmonary tuberculosis among the poor—particularly in such cases as are forbidden exercise on account of fever. This feature is the fire-escape. Fire-escapes are almost universal in tenement and apartment houses, they are very accessible for the weakest patient, they are large enough to permit the placing of a reclining chair or couch, they are convenient for such supervision and attendance on the part of the family as may be required by the patient, and many of them have abundant air and light, varying of course, with the style of tenement, the floor and the direction in which it faces. On the other hand, the fire-escapes are not open to the objection raised (among others) against the roofs, of smoke and gas from the chimneys: they are sheltered in many directions from the wind, or are easily sheltered from wind, rain, and snow by such simple contrivances as umbrellas, screens, or bits of awning.

At the recent meeting of the New York State Conference of Charities and Correction, I advocated the more general use by the medical profession of the fire-escape in the treatment of such cases of pulmonary tuberculosis as could not be accommodated at sanatoria, or for one reason or another did not wish to go to them, or pending their admission to them. Pictures were shown of a consumptive girl of fourteen years taking the outdoor-rest-cure-treatment on the fire-escape of the third floor of a tenement house in the neighborhood of First Avenue and Eighth Street, New York. The photograph was taken on Dec. 21, 1901, the temperature of the air at the time being 24° above zero. Although it was the shortest day of the year the little patient was able to spend about four and a half hours on the escape that day. She first came under my observation early in November, 1901, with extensive tuberculous disease of the left lung of about four months duration—high fever, rapid pulse (140), albuminuria (5 per

Pulmonary Tuberculosis Successfully Treated on the Fire-Escape of a New York Tenement House. Distant View.

cent.), diazo reaction and indications generally of a rapidly fatal issue. The fire-escape treatment was faithfully adhered to all winter, the number of hours spent there increased as the days lengthened, and the neighbors gradually became accustomed to the strange sight of the sick girl lying outdoors in the cold, all bundled up, with only

eyes, nose and mouth showing. The result has been extremely gratifying. The return of appetite and strength, the gain in weight, the gradual reduction and disappearance of fever and cough, the disappearance of complications, all betoken the value of the régime followed under surroundings usually condemned as portending failure. Nor is this an isolated case, but it is illustrative of others seen by me since then in which a similar régime was followed by similar results. This method of treatment is open to large numbers of physicians and patients in the city. It requires perseverance on the part of both physician and patient and the intelligent cooperation of both; above all, it requires a complete emancipation of the tenement-house population from the old idea that pulmonary tuberculosis is a catarrhal disease that compels the patient to avoid cold and exposure, and on the other hand, it requires the education of this same class in the modern view of infection and the advantages to be obtained, even at home, from a very free exposure to air.

There is one difficulty in the way of the general adoption of the fire-escape plan of treatment, but perhaps, after all, this is no real difficulty. I refer to Section 113 of the Building Code of the City of New York, forbidding the placing of "any incumbrance of any kind whatsoever before or upon any fire-escape, balcony or ladder" and providing a penalty for any violation of the same. Every New Yorker knows that this ordinance is more honored in the breach than in the observance. I believe the Fire Department expects the Building Department to enforce its provisions, and the Building Department in turn expects such action from the Police Department.* Public opinion will, I venture to predict, sustain none of them if the ordinance is enforced against those who in their fight for life are making of the fire-escape a real life-saving contrivance.

801 Madison Avenue.

## SOCIETIES FOR THE PREVENTION OF THE SPREAD OF TUBERCULOSIS. THE NECESSITY OF SUCH ORGANIZATIONS AND THE WORK TO BE ACCOMPLISHED BY THEM.†

BY F. M. POTTENGER, PH.M., M.D.,

OF LOS ANGELES, CAL.:

PRESIDENT OF THE SOUTHERN CALIFORNIA ANTI-TUBERCULOSIS LEAGUE; CORRESPONDING MEMBER OF THE INTERNATIONAL CENTRAL-BUREAU FOR THE PREVENTION OF CONSUMPTION; MEMBER OF THE AMERICAN CLIMATOLOGICAL ASSOCIATION; ETC.

With this meeting we begin the organized effort to prevent the spread of tuberculosis in Southern California. That there is need for such a movement no one can deny. Whether or not the society shall accomplish its purpose will depend very much upon the interest and earnestness manifested by the board of directors, since by the provisions of the by-laws of the society its management is largely entrusted to our care; so let the interest manifested be commensurate with the importance of the work to be accomplished.

The tuberculosis problem is one that should interest every one. From time immemorial this disease has been the curse of mankind. In various countries it is accountable for from one-tenth to one-fourth of the total death-rate. Few are the families that have not felt its blighting touch and scarcely can one be found who has not a friend or dear one afflicted with this disease.

Such has been the condition of affairs throughout the ages; yet little has been done to prevent the disease until recent years. England began the movement sixty years ago by passing acts providing for sanitary homes and workshops, believing that there was a relationship between cases of tuberculosis and the bad hygienic condition found in the usual home and shop of the worker. In consequence of this wholesome legislation, the number of cases of the disease decreased. It was not, however, until Koch had discovered the bacillary cause of the disease and proven that it was a disease communicated from one person to another that it was widely believed that it could be prevented.

Few diseases of bacillary origin offer greater hope of an ultimate eradication than tuberculosis. The very nature of the disease favors this. While it is communicated directly from man to man, yet, if ordinary precautions are taken, infection rarely occurs. This is the evidence which inspires us with hope and shows us that tuberculosis is a preventable disease. Another important factor is the slowness with which the disease develops, months and often years intervening between the inoculation and the death of the patient; in fact, far more people become infected, and recover from the disease than die of it. Autopsies show healed foci in the lungs of from one-third to more than one-half of bodies examined. The great majority of these are cured without knowing that they were ever tuberculous. Of those cases in which the disease is diagnosed, at least 50 per cent. in the first stage can be cured by appropriate treatment; and a smaller number in the advanced stages. This gives us our second hope in fighting tuberculosis. It would be very hard to carry on a fight when it were known to be on the losing side; but, in our fight with tuberculosis, we have much to encourage us *for we are dealing with a disease which is both preventable and curable.*

Such being the case, why is it not prevented and why is it not oftener cured? Why is a preventable and curable disease allowed to destroy more than a hundred thousand lives in the United States yearly? This can only be accounted for by ignorance of the facts on the part of the many and apathy on the part of those who know.

Experimental evidence and clinical experience tell us that there are two elements in infection; first, the bacillus, and second, a susceptible individual. Unless both of these elements be present, infection is not likely to occur. We further know that the bacillus comes in every instance

* Since writing the above I have learned that the enforcement of the law, so far as it relates to tenements, is lodged with the Tenement House Department.

† Read before the first meeting of the Board of Directors of the Southern California Anti-Tuberculosis League, Jan. 15, 1903.

from some previous case of tuberculosis, and that susceptibility is due to those things which lower vitality such as living in badly ventilated and poorly lighted houses; overcrowding; living on insufficient and improper food; various diseases; and the abuse of alcoholic liquors. Any comprehensive scheme of prevention should take into consideration all of these elements.

It is gratifying to know that wherever preventive measures have been undertaken, whether they have been directed to the destruction of sputum and other bacillus-bearing discharges, to the prevention of sale and consumption of infected food, or to the elevation of the plane of living of the people, they have been rewarded by a decrease in the death-rate from tuberculosis. A glance at statistics is most instructive to us who are about to take up this work. The following table gives the prevalence of this disease in several of the large cities of Europe, as based upon the number of deaths per 10,000 living inhabitants:

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|---|---|---|
| Moscow | 45.68 | per 10,000 inhabitants. |
| St. Petersburg | 44.10 | per 10,000 inhabitants. |
| Vienna | 42.72 | per 10,000 inhabitants. |
| Paris | 38.70 | per 10,000 inhabitants. |
| Berlin | 23.06 | per 10,000 inhabitants. |
| Rome | 18.85 | per 10,000 inhabitants. |
| London | 17.68 | per 10,000 inhabitants. |

In Russia very little has been done; in Vienna, but little more, while in Berlin and London active measures have been taken to lessen the spread of the disease, especially in the way of better houses for the poor and better living for them; and in Berlin especially, precautions are taken to prevent infection through milk and meat.

A review of what is being done in other parts of the world will perhaps not be out of place here; so I will try to tell you what other nations are doing as best I can from the data which I have at hand.

As mentioned above, England is really the pioneer in this movement. In 1836 she passed an act providing for the construction of hygienic houses. This act has been followed by nearly a dozen more, all directed to the establishment of better workshops and better houses for the workers. Not only was England the first to recognize the necessity of better hygiene in the homes, but she was also the first nation to establish hospitals for those suffering from tuberculous diseases. The oldest of these is the Royal Seabathing Infirmary for Scrofula in Kent County, founded in 1791. Following this was the Royal Hospital for Diseases of the Chest, in London, founded in 1814. The Brompton, the most important of the English hospitals, was founded in 1841.

It is strange to say that, while England was the first nation to establish hospitals for the care of the consumptive, she has been slow in taking up the cause of the early cases and establishing sanatoria where they may have the opportunity and care necessary to regain health. This, however, she is now doing. In 1899 the National Association for the Prevention of Consumption and other forms of Tuberculosis was formed under the presidency of the Prince of Wales. The patronage of the Prince of Wales gave to this movement the sanction of the government; consequently, it has had a steady growth. Many subordinate branches have been established, pamphlets of instruction have been circulated; and the people have been enlightened on this important question.

In Germany, a congress was held in the year 1899 to consider tuberculosis, as a disease of the masses, and how to combat it. This congress popularized the subject of "sanatoria for the poor." Since then the number of sanatoria has been constantly growing, and now there are nearly one hundred institutions where the curable cases of tuberculosis may go to regain their health. One thing that has helped the work of construction of sanatoria in Germany is the insurance law which requires every laborer who is earning less than 800 marks a year to be insured against accident, old age and disease. The insurance companies have learned that it is to their advantage to have tuberculosis diagnosed in its incipiency and to provide sanatoria for those afflicted where they can be cured in a short time. The demand of these insurance companies has called out the best diagnostic ability of the German medical fraternity and they are now diagnosing a very large proportion of the cases of tuberculosis before bacilli appear in the sputum.

France has been slow to establish sanatoria for the tuberculous adult but she has set the world a good example of what can be done in the treatment of scrofulous children. Throughout the nation there are several of these institutions near the large cities and also several on the sea coast. In these, about 50 per cent. of the children are cured. In Paris there are about forty dispensaries for the treatment of children where several hundred thousand children, suffering principally from scrofula and rickets, are treated annually. France has also given us another important lesson in dealing with the tuberculosis problem by establishing dispensaries in the centers of population. In some of these many hundreds of afflicted are helped annually. Not only is medical aid furnished, but in some of them food and clothing are given and a nurse or attendant is delegated to go and see that the home life is healthful and sanitary. In this way not only the afflicted one is helped, but the entire family is instructed in hygenic living and also in the manner of preventing contagion. In the city of Lille, such a dispensary is in operation. In this city it is estimated that there are about 6,000 persons suffering from tuberculosis and from 1,000 to 1,200 dying annually, although there are only about 220,000 people in the city. The great good that such dispensaries can do in a city with so large a proportion of its population tuberculous must be evident to all.

Other European countries have also taken active measures to check the progress of tubercu-

losis, but these great nations represent the best that has been done.

In the United States we have been somewhat slow in taking up the movement. This is due to several things. In the first place, we have no National Tuberculosis Commission, to take up the matter and, secondly, we have no royalty to popularize the movement. Whatever is done here must be done through private initiative hence it is sure to be slow.

The first Society for the Prevention of Tuberculosis in the United States was formed in Pennsylvania in 1891. Since then, Maine, Ohio, Illinois and Missouri have formed State societies; the cities of Buffalo and Cleveland have local societies; New York has a Tuberculosis Committee, and California comes next in the list with The Southern California Anti-Tuberculosis League. We should be proud of the distinction of being so near the front in this great work.

This paper would not be complete without mentioning the Central International Bureau for the Prevention of Consumption. The Central Bureau is composed of members from all nations that will affiliate in the international crusade against tuberculosis. The headquarters of the committee is in Berlin; and, at stated intervals, there will be meetings held for the consideration of the progress of the movement and for the suggestion of better methods. Corresponding members throughout the world keep the committee posted as to what is being done in the various countries and the Central Bureau on the other hand keeps the various members in touch with the general progress. It is expected that the members of the International Bureau will keep themselves posted as to the best methods of combating tuberculosis and that they will be centers for the distribution of facts for their respective countries. In this way, it is hoped that the Anti-Tuberculosis Crusade will take an international aspect, instead of each nation and each State being isolated in its efforts. This organization was formed in the year 1902 and held its first meeting in October of the same year. It is to be hoped that the committee will receive a generous support and that its work will greatly aid in the prevention of tuberculosis.

The problems before the Anti-Tuberculosis League of Southern California are the same as those of any other society which is trying to prevent tuberculosis. The disease is the same wherever found, produced by the same causes and prevented by the same measures.

Here in Southern California, however, we have the problem intensified; for we have not only the cases which develop here but also those which come from without our State, that they may secure the blessings of our climate. To offset this more intense problem, we have an eternal sunshine and aseptic air which renders the dangers from contagion much less than would be the case in a less favorable climate.

Koch is authority for the statement that sunlight will kill tubercle bacilli in from a few minutes to a few hours and Solly says that a room which has been occupied by a tuberculous patient or which has been infected by bacillary sputum may be safely occupied at the end of three to five weeks, if air which has been sunned has been admitted to it. So we see that Nature has been very kind to us in giving us this eternal sunshine and that she has protected us in a manner that is not common to many sections of the world. These facts show us that we may help to prevent infection by making use of sunshine and fresh air in our homes.

Cornet, and later, Coates, under the direction of Delépine, made experiments to determine the infectiousness of rooms which had been occupied by tuberculous patients. The results proved that where the rooms were well lighted and well ventilated the danger was much less than in those poorly lightly and badly ventilated, even though the cubic space per inhabitant were greater in the latter; also, that the dust in houses occupied by tuberculous individuals, who are careless about the disposal of their sputum, is dangerous, while the dust from houses of the same degree of cleanliness not occupied by tuberculous individuals is not infectious.

These experiments taken in connection with those made from the dust collected from the rooms of sanatoria when sanitary precautions are taken and which proved innocuous in nearly every instance; and, also, when considered in connection with the fact that during the past 20 years since the discovery of the bacillus many thousand patients have been treated in institutions and yet neither a nurse nor attendant has been infected in those whose history I have at hand, shows that carelessness is the prime cause of the spread of infection and also that where care is taken there is practically no danger.

According to the public health reports for the year ending December 31, 1900, there were in 18 cities and towns in the State of California, having an estimated population of 675,000, 2,000 deaths from tuberculosis. That is, 17.6 per cent. of the deaths were assigned to tuberculosis, making a death-rate from tuberculosis of 2.9 per thousand of inhabitants. Eight of these cities and towns were in Southern California representing an estimated population of 147,479. In these, tuberculosis caused 23 per cent. of the deaths, making a death-rate from tuberculosis of 3.5 per thousand of inhabitants. When we consider the thousands of tuberculous individuals who come to Southern California annually and especially the number who come to die, and that these statistics include only the centers of population where the death-rate is the greatest, we must congratulate ourselves that our rate per thousand inhabitants is not higher. That it is not is not due to any special precautions that are taken, but must be attributed to the favorableness of our climate. Here people can be in the sunshine three hundred days in the year and even if they are not fresh air fiends, they can have their houses open to the free entrance of air most of the days. This death-

rate, however, is far too high. By proper precautions we can reduce it. We can save the lives of many who come from without our State, and by proper regulations reduce the number of native cases, and in this way lower the rate. How to do this is one of the problems before us.

The work of our league should be carried out along several lines. In the first place we should educate the people to the fact that tuberculosis is communicable. We should teach them just where the danger lies and that if the bacillus-bearing discharges, of which the sputum is the chief, and in most cases perhaps the only one, are carefully destroyed. There is no danger from the tuberculous individual. While we must insist on the enforcement of sanitary laws, we must avoid creating in the minds of the people an unnecessary fear which will work undue hardships on those afflicted. Nowhere can it be said with greater justice that "a little learning maketh mad," for, those who have learned that tuberculosis is a communicable disease and have learned nothing more have become frightened and are associating, in their minds, tuberculosis with such diseases as smallpox. We must emphasize with equal if not greater care that tuberculosis is preventable. We must furthermore teach them how to prevent it, give full and explicit directions for the afflicted and also for those who must care for them. The necessity of sunlight and fresh air should be emphasized.

Sanitary laws relative to the prevention of infection, such as those forbidding expectoration in public places, providing for the notification of tuberculous cases and the disinfection of rooms occupied by tuberculous individuals before being reoccupied should be passed. In order to facilitate and encourage early diagnosis in the cases among the poor, free examinations of sputum should be made for those who are too poor to pay for same. Laws regulating the height of buildings, the height of ceilings, the ventilation of workshops and tenement houses, prohibiting the construction of unsanitary dwellings and overcrowding, would do much to prevent that lowered vitality which facilitates infection and would offer less opportunity for the bacilli to thrive.

Lest I be misunderstood, I would like to offer a word on the subject of notification before passing. There is objection raised to this on the part of some, believing that it will work as a quarantine. Not so. It is only intended that the case be reported that the health officer may see that precautions are carried out. Perhaps, until public opinion is educated, it would be better to have notification optional. No one but the attending physician and the health officer need know that the individual is tuberculous. It should work in favor of the afflicted instead of against him.

Another important field of work for our league is in caring for the afflicted poor. This is a necessary measure from the standpoint of prevention and desirable from the standpoint of the humanitarian. As long as the poverty-stricken tuberculous individual is compelled to care for himself, he will be forced to occupy unsanitary quarters and will scatter infection about him either because of ignorance or because of a spirit of apathy. Since each patient on an average infects one new one, and each careless one may infect several, it can be plainly seen that the care of the helpless poor bears a very important relation to the problem of prevention of tuberculosis; and, since hospital facilities are provided for those suffering from other diseases, it is but just that they should be provided for these.

The Anti-Tuberculosis League could perform for the tuberculous poor an act of mercy, render society a noble service and itself a great honor, if through its efforts there should be established in our midst a system of dispensaries in the cities where those afflicted could come for advice and where those who suspect the disease could be examined while they are in a curable stage; and further, if through its agency there should be provided sanatoria for those who are curable and hospitals for those in the advanced stage.

Such is the work that has been done by organizations of similar aim; such is the work that I hope will be accomplished by ours. We may have to work slowly, for we cannot go faster than public opinion; but, by the distribution of carefully written pamphlets, by the delivery of thoughtfully prepared lectures and by the judicious use of the public press, I believe it is possible to secure a hearty cooperation on the part of the people.

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## THE SANATORIUM TREATMENT OF TUBERCULOSIS.*

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WHEN an appeal is made to the family physician for his counsel as to the best and most promising course to follow as a means of relief or cure in a case of tuberculosis, the question with which he is confronted is by no means so simple as at first appears. Circumstances—varied as individual cases—must be carefully taken into consideration, and will, in each instance to a great extent determine the choice of alternatives which offers. Of these, broadly speaking, there are three: (1) The patient may be kept at home and given the best which his means will permit in the way of care and treatment; (2) he may be sent to an open health resort, where it must be left largely to his own judgment and financial resources as to his personal environment and his medical supervision; and (3) he may be placed in an institution, especially adapted to the care of this class of sufferers.

The chief factors which will have to be considered in reaching a decision in any given case are of course two: (*a*) The extent to which the disease has advanced including the individual

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resistance of the patient, and (*b*) the financial resources of the patient.

Within the limitations of the subject which has been assigned to me, a discussion of the many phases of the question both as to their relative merits in a given case and as to their more general aspects as applied to the class of tuberculosis invalids as a whole would be out of place. It is sufficient to say that with some experience and discrimination each case will, by its own characteristic peculiarities determine the class to which it belongs and the treatment which is best to be accorded. Confusion as to choice of alternatives cannot easily arise when once all the facts are known. The difficulty seems to be that too often advice is given without a sufficient inquiry into the facts, with the result that in every open health resort, many forlorn individuals without sufficient means or sufficient intelligence to secure the rest and medical supervision, which in certain stages of the disease are so imperatively essential, die each year who would have had a much better chance of arrest or cure of their disease in a properly conducted sanatorium. While, on the other hand, in every sanatorium may be found a certain proportion of cases which would be as well or better off in their own homes.

As an outcome of the very general agitation of the subject during the past few years, such mistakes are fortunately becoming more rare and the special functions and inestimable advantages of sanatorium treatment are for like reason much more generally recognized by both physicians and their patients. Brehmer began his memorable work in Gerbersdorf in 1859 and, as every one interested in the subject knows, after contending with more or less bitter opposition for several years, succeeded in demonstrating the value of the fundamental principles which governed his methods to the satisfaction of many of his most severe critics. The sanatorium at Falkenstein, to which Knopf refers as the "Mecca of phthisiotherapeutics," was established through the efforts of his ex-patient and pupil, Detweiler, in 1876. From these beginnings the growth of the sanatorium idea in Germany and Switzerland was constant, though for reasons which will follow presently, much more tardy than would otherwise have been the case with a medical innovation possessing the demonstrable advantages of the sanatorium.

In this country the acknowledged pioneer in Brehmer's methods is Dr. Trudeau, who established the Adirondack Cottage Sanitarium in 1884 and whose splendid labors in this field have gone far toward educating the medical profession in America to a recognition of the advantages of special institutional care of the phthisical patient.

When in 1882 Koch announced his isolation of the tubercle bacillus, attention was for the time almost completely diverted from the slow but rational open air therapeutics of the sanatorium to the golden hope of finding a "short cut" to health in a specific. And to this circumstance, I think, may be attributed the retarded development of Brehmer's ideas. When it was finally understood, however, that curative or immunizing agents for tuberculosis were not to be attained, if at all, until, so to speak, a vast deal of new country had been explored, that antitoxic and bactericidal bodies were not to be available for clinical purposes except by the slow process of scientific evolution—attention of the clinician again turned to the methods which so far had alone given satisfactory results in the treatment of the consumptive. This subject then, notwithstanding the over abundance of literature which recent discussion has brought forth, can not yet fail to be of interest to the practitioner of medicine to whom the question as to how to advise his phthisical patient is constantly arising.

Before entering into the details of the so-called sanatorium treatment of tuberculosis, a few general observations relative to the subject must be first considered. It must be remembered that there can be no universal rules as applying to all cases alike, therefore in describing a routine practice either as pertaining to rules of admission, methods of treatment or to the administration of sanatoria themselves, it must be left to reasonable inference to modify and adapt them to the particular individual in each case. For instance as to the location of the institution, both in its relation to climatic advantages and public convenience. Experience bears out the truth of the saying that while no climate is specific for tuberculosis many climates are useful. Indeed, so long as the essentials of Brehmer's methods are secured, the location of the institution in which they are carried out may be safely left to expediency. The first of these essentials is unquestionably pure air, and plenty of it, and as it is obvious that this important desideratum cannot be secured within the immediate limits of a thickly populated city, the site for a sanatorium should be sought elsewhere. Nevertheless it must not be forgotten that excellent results are obtained in two sanatoria situated within a radius of three miles from the center of the city of Edinburgh, and I am informed that the "sanatorium wards" of Brompton Hospital yield amazingly good results, notwithstanding that the institution is within the limits of a thickly populated London suburb, and what is still more important that but a very small proportion of its patients are received in the earlier stages of the disease. L'Hopital Boucicaut, as you know, is within the fortifications of the city of Paris, yet in the pavilions set aside for phthisical patients there, it is remarkable what is done toward the arrest of the disease. It must be admitted, therefore, that sanatorium methods may, to a certain extent, be successfully carried out even in towns, while at the same time no one will deny that a location remote from centers of population is much to be preferred.

Wards and pavilions for the reception and sanatorium treatment of phthisical patients in connection with town hospitals have recently come to be recognized as a crying need, and while

such can not for apparent reasons be considered ideal institutions they are nevertheless the best expedients which the urgent necessities of the situation can suggest, and after all much can undoubtedly be accomplished in them.

Again climatic influence as a feature of sanatorium treatment should be here considered. The subject of climatoloy in relation to tuberculosis is, I am aware, not within the province of this paper and is elsewhere fully and ably discussed. It is, therefore, sufficient for present purposes to limit my remarks to the question as it relates to sanatorium treatment alone. That there is a certain percentage value in altitude in phthisis I am convinced, but just what that percentage is, has never so far as I know been satisfactorily worked out. It is probably not large and when applied to all cases as they occur in practice, *i.e.*, early and advanced stages alike, is entirely wiped out. Unquestionably sanatoria situated in the high altitudes, *e.g.*, from 5,000 to 15,000 feet are far more limited in their scope of usefulness than is the case with those at the more moderate elevations. I have heard it remarked, on the other hand, by one whose broad experience gives authority to the statement that no institution intended for the treatment of patients in the early stages of phthisis should be located at less than 1,000 feet above tidewater, and from my own experience, I am much inclined to agree with him.

The advantages to be derived from altitude may be summed up in (*a*) the rarefication of the atmosphere and the consequently lessened barometric pressure, (*b*) the reduced humidity, (*c*) the ascepticity of the respired air and (*d*) the diathermancy. Now, in a method of treatment in which life in the open air plays such an important part these advantages demand thoughtful consideration.

The question of direct sunlight and wind is still an open one. Recent observations seem to show that diffused sunlight, such as obtains on cloudy days, has in tuberculosis all the therapeutic advantages of the direct sun's rays. For my own part, I believe that in this as in many other questions in phthisiotherapeutics, adherence to extreme views is a dangerous policy. Certainly a considerable amount of sunshine is desirable in sanatorium treatment, while at the same time it is remarkable that during the winter months in our climate when the number of cloudy days exceeds by far those of the summer months, sanatorium patients make their most rapid and substantial gains. The same is true in Davos, St. Moritz and Arosa. It is possible, however, that other causes enter in to produce this result.

In spite of contrary opinions on the part of many authorities I am in favor of wind in a resort for phthisical patients, protection of the individual from direct exposure is easily accomplished by shelters and the purifying and invigorating effects of strong, cool and dry wind in a pure air can not be overestimated. It secures ventilation of buildings and apartments much better than any artificial device can do and when patients are constantly living in the open air, as in a sanatorium. I have not remarked that it ever increases liability to colds or aggravates catarrhal conditions of the respiratory mucous membrane, which I believe are the chief objections which have been brought against it.

In short the location for a sanatorium should be sought in a climate which need be neither very cold nor very warm—it should be sufficiently dry to prevent the depressing and enervating effects of excessive humidity, yet not so dry as to permit dust suspension in the air. It should be stimulating and possess atmospheric conditions which favor the development of nervous and muscular vigor and the altitude should whenever possible exceed 1,000 feet.

The two fundamental principles of sanatorium treatment as established by Brehmer, and which in their essentials have not as yet been improved upon, are hyperaeration and increased nutrition. The first is attained by constant life in the open air, and the second by systematic feeding to the limit of the patient's capacity for assimilation.

Brehmer himself was an advocate of exercise in the open, while Detweiler introduced and has practised rest in a reclining position in connection with the "cure" at Falkenstein. At present the consensus of opinion is vastly in favor of the latter plan as effecting the best results, yet in this as in so many other medical doctrines extreme views are fraught with danger. One cannot resist the temptation to protest against a long continuance of a life of supine inactivity after the more urgent symptoms of the disease have subsided and the ravages of tissue waste have been compensated as shown by a return to, or nearly to, normal weight and temperature. That weight can be rapidly and enormously increased by a persistent adherence to a life of absolute rest and stuffing is certainly to be admitted but it has been demonstrated only too often that this increase above normal either in amount or rapidity is at the expense of the general well-being of the patient and is soon lost on return to the ordinary mode of living. It is well in this to be guided somewhat by analogy, and the fact is well known that stall-fatted cattle are far more prone to tuberculosis than are the grazing herds of underweight kine on the prairie.

On this point the recent work of Bardswell, Goodbody and Chapman, in the Brompton Hospital, is interesting and instructive, the conclusions which they reached are of sufficient importance to quote in full:

1. "That since very large diets gave worse results than those of more moderate amount, the indiscriminate stuffing of all tuberculosis patients should be replaced by systematic dieting. The diets as regards amounts and constitution should be determined in each case after due consideration has been given to the respective conditions as regards: (*a*) The activity and extent of disease; (*b*) amount below weight; (*c*) digestive capability; and (*d*) to some extent, personal dietetic likes and dislikes.

2. "That in view of the bad effect which overfeeding gave rise to in the normal individual, great care should be taken in the selection of a diet for patients who, as the result of treatment, have reached or passed their highest known weights. When this regain of weight is associated with arrested disease, the original diet found suitable for a person very considerably under weight and with active lesions, should be reconstructed more upon the lines of what would be suitable for the same person in perfect health.

"The observations were not sufficiently extended to allow of conclusions being drawn as to which diets gave the best results as regards the condition of the lungs; but subsequent sanatorium experience of two of us, with the advantage of being able to carefully observe the course of pulmonary lesions in patients upon weighed diets, leads us to think that the lungs do not improve any more rapidly upon forced feeding than upon generous diets. Futher, there is no doubt that anorexia, dyspeptic symptoms and vomiting are much more frequently met with when working with very large diets than when more moderate amounts of food are given."[1]

With regard to the kind and amount of exercise permissible and the class of patients to whom it is applicable I shall presently give the results of some interesting experiments and observations made at the Loomis Sanatorium Annex last fall. Of one thing we may be quite sure, that even in this matter of exercise and feeding there are no hard and fast rules which can be universally employed. In the sanatorium as in private practice, success in treatment in the highest sense is not to be attained by grouping and classifying patients and treating them accordingly. Each individual is a law unto himself and should demand attention and treatment on his own merits, irrespective of the class to which his condition might relegate him. In other words, the patient and not his disease is to be treated.

And this brings up the matter of medical supervision upon the efficiency of which depends the success or failure of the sanatorium. It is unfortunately true that in the past a certain amount of discredit has been cast upon these institutions through the occasional lapse from the proper ideals to those of the hotel proprietor. The commercial instincts of the inn-keeper are incompatible with the highest development of the sanatorium. The medical officer must have the helm and must never lose sight of the fact that he is, first of all, the physician; and that the relation which he bears to the management is that of the captain to the engine room. I believe that to the best interests of the sanatorium, it is essential that the medical officer should have had a more or less mature experience in private practice before undertaking institutional work. He has thus been taught to individualize his cases and to avoid the danger of treating them in groups and classes collectively.

In this connection I remember upon one occasion visiting a large military hospital for consumptive soldiers. At a certain hour, with soldierly precision, the bugle summoned several hundred ambulant consumptives into line. The surgeon-in-charge, an excellent man but with military training hopelessly ingrained upon his methods, then proceeded down the line, his assistants and orderlies reading from charts synopses of the last twenty-four hour records from which data the procedures for the day were prescribed and the men dismissed to quarters. Thus without elasticity or the least attempt at individualization the greatest possibilities of the sanatorium were lost. It represented better perhaps than anything else could have done—*treatment by averages*—a sort of medical "dead reckoning."

The medical staff of a sanatorium should be much more than the special inducement of a health resort hotel and in the few instances above mentioned where adverse criticism has been merited, it has, I think, been attributable to failure to recognize this fact. For efficient service the work in the sanatorium should be appropriately divided so that for every multiple of 30 patients there should be an additional medical assistant. Some authorities, I am aware, allow of a considerably greater number, but it is best to err on the right side in such matters and wherever possible to avoid the danger of falling into the thraldom of routine.

Of course, the narrower the limitations which govern the admission of patients the larger the number which can, with good judgment, be accorded to the service of one physician. But when a proportion of advanced cases are admitted, if any attempt is to be made toward individual clinical investigation, the staff must not be curtailed.

The laboratory of such an institution should be equipped not only for the ordinary clinical work but for medical research as well. Every sanatorium should aim to contribute its due share to the general fund of scientific knowledge on a subject so important to the welfare of the race as is tuberculosis. With such opportunities as are here offered for laboratory and clinical research it is surprising how little in the way of original investigation has been done in sanatoria; from this general statement, however, it is gratifying to be able to point to the splendid exception of Dr. Trudeau's Saranac Lake laboratory, which in a way is an outgrowth of the Adirondack Cottage Sanitarium and which has always been and always will be a credit to its founders.

While I admit that it might be too much to expect from the average sanatorium that it should in this respect emulate the example of the Saranac Lake institution, I still contend that there is much valuable labor of investigation well within the scope of every properly equipped institutional laboratory, and which when accomplished will add inestimably to our practical knowledge of the treatment of tuberculosis. I would suggest, for instance, further study into the problems of metabolism, a more systematic study of the sera and the formed elements of the blood, investiga-

tion into the shadowy unknowns of mixed infections, further research in dietetics and so on ad infinitum.

The question of nursing arises in every sanatorium where any but the earliest stages of the disease are admitted. I know of no class of invalids the care of whom makes more heavy demands upon the tact and discretion of the nurse than does the moderately advanced consumptive patient. The institutional nurse, therefore, should be chosen first with regard to her training which should be like the physician's—a special one upon a good foundation of general practice—and of no less importance, with regard to personal adaptability and resourcefulness. A well-qualified nurse who meets the requirements will do more to make the atmosphere of the infirmary cheerful, hopeful and unobjectionable, than any other one agency which it is possible to introduce.

We have now to consider what classes of phthisical patients are suitable for sanatorium treatment; what results may be hoped for and what duration of residence may be taken as the average minimum for each class. For the purpose of present convenience, tubercular invalids may be grouped under three heads: (*a*) those whose condition is hopeless; (*b*) those whose condition permits of an expectancy of an improvement or an arrest; and (*c*) those whose condition justifies a hope of cure.

Each of these groups has a distinct and peculiar claim upon institutional care and treatment as embodying the best practical therapeutics which for the time being are within the reach of the consumptive. The first on the ground of the weal of the public health no less than on humanitarian considerations. The second on the ground that extension of life, even when that life must be circumscribed by narrow limitations, is a worthy object and may have a value entirely disproportionate to what appears and the third on grounds too obvious to require argument.

An institution devoted to the care of hopeless cases, however, can scarcely even with the broadest interpretation of the term, be considered a sanatorium and accordingly need not here be discussed, but with the other two groups the average sanatorium has to do.

Until quite recently the true incipient type of the disease was comparatively seldom recognized, and as a consequence the average patient admitted to even the most exclusive sanatoria was one who to-day would be classed as advanced, yet the results as shown by the numbers discharged as "apparently cured" and "arrested" were remarkably gratifying. Now we know full well that the healed tuberculous lesions found in the autopsy chamber, in persons dying from other causes and which furnish us with such abundant evidence of nature's cure of the disease, are in the vast majority of cases, arrests in the early stages before softening has occurred. It therefore should require no argument to convince one that the earlier the case is placed under sanatorium treatment, which means after all merely placing the patient in the best possible condition for nature to effect its cure, the more certain is arrest secured and the shorter will be the duration of residence. It is therefore in the early stage that we should endeavor to obtain the cases for sanatorium treatment, but on the other hand, theoretically true as it may be that with sufficient vigilance advanced cases except in a few overwhelming infections, shall cease to occur, we have to face the fact that they *do* occur. It is indeed frequently the case that the insidious inroads of the disease have already produced advanced lesions before the patient is aware that he is ill and as fervently as it might be wished that it were otherwise we are obliged to accept these cases for sanatorium treatment. It is interesting and encouraging, therefore, to know what can be accomplished in these more advanced cases.

In a report of the treatment of 1,000 consumptives, at a sanatorium in Russian Finland, Gabrilowitch gives the following statistics: 122 were in the first stage, 720 in the second stage and 158 in the third stage, 72 per cent., therefore, were in an advanced stage on admission. On discharge there were 253 *cured*, 472 improved, 187 classed as "without result" and 88 died: 72½ per cent. were therefore cured or improved and 25.3 per cent. cured alone.[2]

That advanced cases, therefore, are often arrested and apparently cured when placed under suitable conditions is undeniably true and the sanatorium unquestionably has a scope of usefulness beyond the limitations of the incipient tuberculous patient. In admitting patients to the Adirondack Cottage Sanitarium, which excludes all but the earliest cases, Dr. Trudeau pursues an excellent plan for determining the suitability of cases: First is ascertained duration of disease, and if the patient has or has not steadily declined since then; second, the present status of the patient is noted with particular reference to amount of fever, sweats, cough and expectoration; third, chief importance is attached to rational symptoms rather than to physical signs. Those favorable for admission are (*a*) pleuritic cases, (*b*) cases with fair nutrition and slight impairment of health, (*c*) cases beginning with hemoptysis without constitutional impairment, (*d*) incipient cases.

Those unfavorable for admission are (*a*) cases which have steadily declined since onset; (*b*) cases showing a preponderance of constitutional impairment over comparatively slight physical signs; (*c*) those presenting complications especially laryngeal, glandular, intestinal, bladder, renal or joint affections; (*d*) all septic cases showing type of periodic hectic fever.[3]

Thompson Campbell, like Trudeau, would exclude patients who, although presenting slight objective findings have pronounced (evident) prostration of strength from the onset. He lays special stress upon the pulse frequency as a prognostic sign and unconditionally excludes all cases with albuminuria and pronounced tuberculosis of the larynx.[4]

In a sanatorium wtih sufficient infirmary accommodations, cases which might otherwise be excluded, may be admitted on a short trial with the hope, which is often realized, that the unfavorable type of the disease may be changed.

There is, to be sure, a certain type of laryngeal tuberculosis marked by more or less extensive ulceration with surrounding induration and edema of the mucosa, involving the arytenoids and often the epiglottis and usually accompanied with severe and painful laryngeal symptoms which are invariably associated with rapidly fatal cases, and unquestionably such patients are not to be materially benefited by sanatorium or any other treatment, and should therefore be excluded. But to class all laryngeal cases together as rendering patients unfit for the sanatorium is, I think, too sweeping a plan and does injustice to many whose condition is susceptible to great improvement or cure. Every laryngologist is familiar with that form of tuberculous ulceration occurring in the larynx usually on or near the posterior extremities of the vocal bands or in the interarytenoid fold, which under favoring circumstances (rest and suitable treatment) undergoes fibroid change and results in healing. Now the place of all others for such patients, it seems to me, is in the sanatorium where the facilities are at hand for giving them that constant medical supervision and favorable environment which are most needful and almost unattainable under ordinary conditions.

With a judicious selection of cases, therefore, laryngeal tuberculosis per se need not necessarily exclude a patient. If the aim of the sanatorium is merely to turn out the highest percentages of "cures" and "arrested" cases, however, I will admit that it is the *safer* plan to exclude *all* laryngeal complications.

It is well here to remark in parenthesis that by "constant medical supervision" I do not mean that persistent topical meddling with the larynx, which the inexperienced laryngologist is unfortunately too apt to practise. It requires but a little attentive observation to demonstrate how beautifully nature takes care of these "by-products" of tuberculosis as soon as general nutrition and vigor are brought to approach the normal.

The minimum duration of residence in the sanatorium and the results to be expected in a given case are questions which can only be answered tentatively or not at all. But we can on the other hand employ averages to some advantage, taking as standards the excellent and trustworthy statistics of Dr. Trudeau and Dr. Turban. From these we may gather that the minimum term of residence for the incipient and uncomplicated case should not be less than three months, while for the moderately advanced case with favorable symptoms a six months' residence may be considered as the mean minimum which will effect a satisfactory arrest or apparent cure. If these figures were more generally kept in mind there would be fewer instances of patients coming to the sanatorium with the comforting but misleading assurance from their family physicians that a few weeks' residence would be all that was required. When the term "cure" is employed in this connection we must distinguish as do the Germans between a "pathologic cure" and, as they put it, an "economic cure" ("wirtschaftliche Heilung"). To achieve the former it is obvious a much longer time is required. It appears, however, that when the latter is accomplished patients may safely be permitted to return to their homes and occupations—provided, of course, that their homes are clean and their occupations wholesome where, imbued as they are, with sanatorium methods relapse is comparatively infrequent and the pathologic cure finally effected.

The average duration of residence in the instance of patients discharged from the Loomis Sanatorium as "apparently cured" and "arrested" for the year ending October 31, 1902, was six and a half months in the case of those whose lesions were classed, on entrance, as "early" and "moderately advanced" the longest term of residence was 23.5 months, the shortest two months.

In a word the duration of residence and the results obtained will depend almost wholly upon the patient's condition on admission and his willing cooperation during the treatment. This latter factor is one which, while seldom difficult to secure if a little tact is exercised and the patient is even fairly intelligent, is of so great importance that without it the patient had better be at once discharged, both for his own good and for that of other patients in the institution.

As a matter of fact this difficulty is one which is rarely to be encountered in the sanatorium. No one can make even a brief sojourn at any of the great institutions without being profoundly impressed with three remarkable phenomena. First, the general air of good cheer and hopefulness which prevails. Second, the strikingly healthful and even robust appearance of the patients, and third, their evident capacity for large amounts of food. For those who have never visited an institution of this nature, there is a surprise and an education in store, and yet I have heard it remarked and with no little emphasis by some physicians that they could not bring themselves to advise their patients to go to a sanatorium because of the atmosphere of invalidism which they imagined could not but prevail there. This however is an old, and I am happy to say, declining fallacy born of experience in open health resorts and not in the closed sanatorium.

One has not to go far to discover the explanation for this cheerful attitude of mind on the part of these patients. There is a sort of communal sympathy and general interest in the fight which all are making which is perhaps the first cause. Then the gregarious instinct of the race finds the pleasantest possible expression under the circumstances in the cottage or pavilion life of these people all bent upon one object, namely, the recovery of health. Instead of inducing depression this stimulates courage and it is apparently recognized by the patients themselves that in this com-

munity of interests there is a moral strength which could not be found elsewhere. Whatever the cause, however, the fact remains that whether at Gerbersdorf, Falkenstein or Nordrach; at Davos or Arosa; at Saranac Lake, Asheville, and Silver City or at Liberty, the cheerful and healthful mental attitude which one finds prevailing within the precincts of the closed sanatorium, is in striking contrast to that which is often observed in the open resort.

Before proceeding to the final and more specific discussion of my subject it is well to say just a word in defense of sanatorium treatment as opposed to the argument in favor of carrying out sanatorium methods in the home of the patient. It has been argued that inasmuch as Brehmer's methods could be introduced into home treatment as in many cases has already been successfully done, it was therefore unnecessary to remove the patient from his family and friends and thus impose upon him a gratuitous sacrifice, by residence in a sanatorium; that the discipline of the institution while no doubt necessary there, was a feature which could not but be irksome and otherwise objectionable to the average American, imbued as he is with a jealous love of his personal freedom. Now it is my experience, and, I think, that of nearly all, who work in sanatoria, that with the intelligent invalid "no vigilance is fastidious, no skilled control vexatious." In the vast majority of cases we not only have the willing cooperation of the patient but when once he is made to understand the value and necessity of a systematic course of living, one obtains his enthusiastic support and he becomes at once a missionary in the field.

In the course of his address before the section for the Discussion of Sanatorium Treatments at the British Congress, 1901, Prof. Allbutt said: "The method was worked out in a sanatorium created for the purpose. It has been tested and perfected in sanatoriums, and if now it can be carried on outside of sanatoriums, which is not too readily to be admitted, this is so only by bringing the skill and conditions of the sanatorium into the home. I should look with little confidence on the home treatment of a phthisical patient by a physician unversed in the practice of a sanatorium, and by a patient who had not at least a month's training within its precincts. It is, as it were, to tell a boy at home to read his Caesar and his Xenophon, a little Euclid and algebra, to pat him on the head, bid him be good and industrious and promise to call in a week or ten days to see how he has got on."

It is unfortunately impossible to give every phthisical patient the benefit of residence in a sanatorium. We are, and for some time shall continue to be, for one reason or another, obliged to care for a considerable proportion of these cases at their own homes. But I still contend that wherever the choice is possible it should, in the majority of cases, be in favor of the sanatorium.

(To be Continued.)

## TUBERCULOSIS OF THE MIDDLE EAR, WITH THE REPORT OF A CASE.*

BY Z. L. LEONARD, M.D.,
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As with other parts of the human body so the ear may be the seat of a manifestation of the tuberculous process. It may precede a general systemic infection which later develops in the lungs or in the parts remote from this location. Usually, however, it is secondary to an attack in other quarters which has progressed to an advanced stage. On account of its insidious, painless approach and because of the gravity of the disease elsewhere the trouble with the ear is overlooked, or if noticed, little attention is paid to it. It is more likely to excite the curiosity of the otologist and to be recognized by him as a sequence to his inquiring research.

As early as 1853 Wilde gave a description of the appearance of the drum-membrane and neighboring parts which antedated that of other writers on the subject. In 1865 Politzer more fully described the conditions by which tuberculosis of the ear might be recognized. This is all that was known with any degree of certainty, unless we except the writings of Buhl, who pointed out the fact that when pus was collected in an osseous cavity the walls facilitated absorption and tuberculosis supervened.

It was not until the discovery of the specific bacillus that a diagnosis could be made beyond the doubt of a denial of the existence of the disease in the ear. If it were not taken for granted that it was secondary to tubercular disease elsewhere it would be next to impossible to form a definite diagnosis from the appearance of the ear other than by excluding causes which lead to suppuration under ordinary circumstances. The discharge differs but slightly from that seen in a case of chronic purulent otitis media. It differs somewhat in this respect that it is less thick and more irritating as it flows over the healthy surface. But there are other signs which would draw the attention of the surgeon to the fact that he has to contend with a something which is out of the usual.

These symptoms should be almost, if not quite sufficient for him to arrive at a definite conclusion in the matter. It would be a comparatively easy task for solution when the disease was secondary to its inception in the lungs or joints, though rather more perplexing when the initial invasion was in the ear. An array of indications, like those about to be enumerated, would nearly cover all that can be known until the aid of the microscope comes to make assurance positive. For instance, the grayish spots in the membrana tympani before it has ruptured; the multiple perforations; the rapidity with which the bone yields to disintegration and the absence of pain. This combination is of so much importance that it would be within the bounds of reason and judgment to form a conclusion approximating defi-

* Read before the Harlem Medical Association, Mar. 4, 1903.

niteness without the certainty which the microscope gives.

In advanced cases a characteristic symptom would be the progressive destruction of tissue, even when other symptoms were absent or not sufficiently regarded by the surgeon. The discharge is not often of foul odor, although from the nature of such a case one would be inclined to expect it where the dissolution of bone moves forward in so rapid a ratio. It might be contended that many if not all of the symptoms discoverable to the naked eye are attributable to the existence of a cholesteatomatous mass, but Scheibe avers, "I have not been able to find Koch's bacillus in the cases of chronic purulent otitis with cholestatoma."

Tubercle has been found primarily in the mucous membrane of the middle ear and in the spongy tissue of the petrous portion of the temporal bone.

Lermoyez mentions that the latent tuberculosis of adenoid vegetations may be the origination of the disease in the ear, a fact which is not without influence when we reflect that these growths present themselves in close contact to the Eustachian canal and that the pharyngeal openings of these ducts are found to be widely dilated when tuberculous infection has invaded the aural structure. These patent orifices may have been the cause and not the result of disease in the ear, affording an easy egress to the bacilli which have remained quiescent in the pharynx, their exact locality not having been suspected. This is another confirmation that these products should always be removed by a competent hand, no matter what their size or the age of the patient.

The aspect of the perforation through the drum is diagnostic. As a rule they are two in number, but a few observers have detected more. Swain asserts, "multiple perforations are considered a sure presumptive sign of tuberculosis and my own experience would lead me to place as high a value upon this piece of evidence as I would upon the presence of a pyriform swelling of the arytenoid cartilages of the larynx, or upon that of a dull apex of the lungs." These openings soon run together to form one large circular perforation with thick, everted edges and a bluish-white edematous look. The deafness is noticed early and is progressive with loss of bone conduction and lowering of the upper tone limit when the labyrinth becomes involved.

It was Schwartze who, in 1878, first described the tuberculous nodules on the membrana tympani. In 1883 Esche demonstrated the presence of the tuberculous bacilli in the discharge from the ear. In mixed infection these bacilli, always few in number, gradually decrease as others increase. They may even disappear altogether as the disease in the ear becomes less severe for remissions and exacerbations are common. In this way cases have been observed extending over a long period of time the general health not having been materially affected. This, however, is not the rule, as it runs a fulminating course destroying every structure which would impede its rapid onward career.

The treatment must be similar to that which would be pursued in any case of purulent discharge from the ear, antiseptic, stimulating or by using astringents. But the treatment should by no means be localized to the ear, for these patients require active measures to elevate the general lowered condition and to put them in a position to oppose the further advancement of the affection. The otologist should never lose sight of the physician. Operative interference may be resorted to by opening up the mastoid cells if they should be invaded. Curetting away diseased tissue should be attempted with extreme caution, but is practicable in many cases, if precautions are taken not to be too thorough in the desire to remove portions lying over vessels or nerves likely to be harmed.

The case to be reported in connection with what has been said on this subject of tuberculosis of the ear is as follows:

*Case.*—A. M. C., aged twenty years, of American parentage, was first seen in the beginning of October, 1901. Parents were living and in good health. A brother and a sister had died of phthisis in early adult life. Members of the mother's family had also fallen victims to tuberculous disease. The patient was of a delicate appearance, fair of complexion and anemic. Until the previous winter, however, she had never had any severe or continued illness. At this latter date she had an attack of influenza, the recovery from which was exceedingly slow. The symptoms of this sickness expended their force in the nose and head with some pain in the ears but no discharge from them.

Whatever cough there was soon disappeared. The prominent and lasting symptom was that of lassitude. The patient's disposition had changed from that of cheerfulness to one of deep melancholy.

In the early summer of 1901, she was treated for malaria, or what was so designated, by the family physician. Later on she went to the country where there was a gain in strength and weight. In September, or two weeks before she came to me, on awakening one morning the pillow was seen to be soiled and the left ear was discharging a slightly offensive matter although there had been no previous premonitory signs that there was anything wrong with the ear. This flow was removed and the ear kept clean by the use of the syringe and warm water but no surgical advice was sought until her visit to me.

My examination disclosed the fact that there was an oblong opening in the posterior superior quadrant extending downward, however, beyond a central line. That part of the membrane which was still in situ was pale in color and the edges of the perforation were edematous and everted. The muco-purulent discharge was wiped away so that the tympanic cavity might be inspected as much as possible through the aperture. The mucous membrane was thick and jellified in ap-

pearance; the probe sinking into the softened tissue gave the impression that there was caries of the underlying bone. The part which was most to be noted for this charateristic was directly over the promontory and adjacent to it. The region of the attic did not appear to be implicated.

The absence of pain during any period of the disease was commented upon, especially when there had been such a destructive activity going on. The long handle of the malleus was eroded and a part had disappeared. There was no mastoid tenderness, nor had there been any, so far as the patient was aware.

In the vault of the pharynx there was a small growth of adenoid vegetations which were subsequently curetted away. The pharyngeal orifices of the Eustachian tubes were wide and patulous. The larynx appeared to be normal, there being no evidence of any enlargement of the arytenoids or of any congestion along the free border of the vocal cords. The respiratory murmur was clear in all parts of both lungs. There was no history of rheumatic or other pain in the joints at this examination, although this fact was elicited some weeks subsequently, but not, however, until after the right ear had begun to discharge.

Simultaneously with the exit of pus from the ear a loss of hearing was perceived which was steadily progressive in character. Both ears were involved in this deafness. Somewhat later, after the right membrane broke down there was a decided diminution in the upper tone limit lateralized more to the left. There was never any evidence that a cholesteatoma was the cause of the discharge. The case was regarded as one of ordinary otitis media purulenta and was treated in accordance with that view of it. Under treatment the amount of discharge lessened without ceasing totally, while the deafness increased and the subjective noises, hammering in the head, became almost intolerable.

In the last week of December, 1901, there was a discharge from the right ear, painless and gushing out during sleep to be first observed, as formerly with the left ear, on the pillow in the morning. On inspection a few hours later there were two perforations in the lower half of the drum membrane, a narrow strip of tissue separating the openings. From these there flowed a matter of the same consistency as that in the left ear. The probe passed into a jelly-like mass. The perforations were where there had been seen for some time before a clump of what were supposed to be petechial spots but which were in reality the tubercle nodules. A specimen of the exudation from each ear was now submitted for microscopic examination with the report that this investigation proved the existence of the tubercle bacilli in both. The perforations in the right membrane within a few days had coalesced into one large circular one with destruction of, at least, half of the membrane.

During the winter, despite all efforts to bring about a change for the better, the discharge remained practically the same. Curetting was performed several times, which seemed to be of benefit, but in March, 1902, a cough developed and it was found that the lungs were to become a part of the process of destruction.

In May she went away from the city and was not seen again until August. There was then a foul-smelling discharge from both ears which were blocked up with granulations and the deafness was almost complete, with vertiginous seizures.

There was consolidation of the right apex, tumefaction over the arytenoid cartilages, night sweats, emaciation and a constant hacking cough with expectoration. The patient was not seen again.

The inference drawn from this case is that the origin of the tuberculosis was in the ear, but the fact that both ears succumbed would perhaps give evidence to the view that it had begun in the vault of the pharynx extending upward. There is no doubt that the lungs were secondarily involved. Such cases are a witness to what should become a routine practice, to submit to the microscopist for diagnosis and verification the products of an unhealthy discharge not alone from the upper air passages but from the ears as well.

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## THE PRESENT STATUS OF SOME OF THE PROBLEMS OF TUBERCULOSIS.*

BY JOHN L. HEFFRON, A.M., M.D.,
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In March, 1903, twenty-one years will have passed since Koch gave to a waiting and expectant world the discovery of the tubercle bacillus. His treatise on the "Etiology of Tuberculosis" is a model of scientific writing. His observations were so accurate, his researches so far-reaching, his demonstrations so complete, and his deductions so logical that in the years that have passed nothing of any importance has been added to or taken from them by the great host of earnest colaborers throughout the world. This work alone will make his name immortal however Fate or Envy may tarnish the luster of his fame.

The impetus that was thus given to renewed study of tuberculosis cannot be exaggerated. The demonstration that the disease could be reproduced at will in susceptible animals practically made tuberculosis a disease that could be studied in the laboratory with the same degree of accuracy as are chemical and physiological processes, and it is to the laboratory investigators of tuberculosis, of whom Trudeau was the pioneer in this country, that we are indebted for all the advancement of our knowledge concerning the entire subject.

The demonstration that the tubercle bacillus is the essential etiological factor in producing tuberculosis and that it was always present in tubercu-

* The address of the retiring president, delivered before the Syracuse Academy of Medicine, Jan. 6, 1903.

lous discharges, was speedily followed by the convincing proof that its presence could be shown in the dust of infected houses, of churches, of the theaters, of public conveyances, from clothes soiled by expectorations and from the face and hands of the tuberculous. Experimentation and accurate clinical observation soon convinced all that the instances in which it could be conveyed from parent to child were so very few that direct heredity as a causative factor could be practically ignored. The tremendous import of this advance in accurate knowledge is not yet properly appreciated by the people or by physicians. The great white plague had cursed man so many centuries; it had become so familiar to every one everywhere; it had been seen to lay low whole families and to slay in successive generations so relentlessly, that a feeling of hopeless indifference had possessed the minds of men, and to this day much of that sentiment remains amongst the laity and amongst many who practice the healing art.

The other etiological factor, equally important, was recognized by the earliest of medical writers. By them, as by us, it was observed that unsanitary and unwholesome methods of life contributed directly to increase the number of victims of consumption, and of other diseases. They had known that anything which debilitated the individual made him more liable to succumb to disease. They knew the "soil" as well as we, and the most intelligent of them were as keen in advocating a return to natural modes of living as are we. I well remember the words of Professor Alonzo Clark in his lecture on the treatment of consumption. He said "Gentlemen, if I should become afflicted with consumption, I would go up to the Catskill mountains, buy a stage, and drive myself." Accurate clinical observations and laboratory research have conjointly demonstrated that to a congenial soil the universally distributed tubercle bacilli will find their way and will manifest their activities in one of their various modes of expression. This is absolute knowledge and is capable of demonstration to any one who has eyes to see. The problem for us is to see that this knowledge shall be the possession of every person whose mind is large enough to comprehend it, and to insist that sanitary laws must be enforced on those too ignorant to understand or too lazy or too wilful to yield intelligent or willing obedience.

Up to two years ago it was generally conceded that tuberculosis in man and in animals was one and the same disease, having the same essential cause and the same secondary causes, as crowding of cattle in insufficiently ventilated stables, etc.; that whatever differences in manifestations of the disease in man or animals were noted, and whatever variations in the form and characteristics of the bacilli were observed were due to their environment in their host, and that it was possible to produce tuberculosis in man by use of milk or meat which contained the living bacilli of bovine tuberculosis. At the London Congress of Tuberculosis in 1900 Koch, who originally taught this, gave as the result of his experience with tuberculosis in cattle and in man, some observations which went to discredit the probability that man was ever infected by tuberculosis from the consumption of milk or flesh from tubercular cattle. In the Berlin Congress in 1901 he reiterated this statement and analyzed all of the cases which had been brought to his attention designed to prove the contrary and in a way so masterly that at the end of his argument the cases cited were conclusively shown to be of no value as evidence. You remember the commotion this made, and the consternation it caused among those who had labored long and hard for the elimination of tuberculosis from dairy herds. To some of us it seemed to set back the hands of the dial of progress, and to make necessary another long struggle with the self-interest of the owners of dairy herds. Fortunately perhaps, his ideas were so bitterly opposed by such an array of men of eminent talent and of large influence in agricultural affairs, that the laws of the civilized world regulating the production of milk and the sale of meat were not seriously affected. Different nations and States have appointed commissions to investigate anew this deeply important problem, and a stimulus was given to individual laboratory investigators the like of which has not been seen in all these 20 years. Results are beginning to come in. Already several important papers have appeared, the most noteworthy of which in this country are those of de Schweinitz, who experimented with monkeys, and Ravenel whose conclusion of a most interesting paper, read to the Pathological Society of Philadelphia in April, 1902, is this, "The evidence at hand forces us to conclude that human and bovine tuberculosis are but slightly different manifestations of one and the same disease, and that they are intercommunicable. Bovine tuberculosis is, therefore, a menace to human health." While tuberculosis is a laboratory disease for animals, it is manifestly impossible to experiment on man, and therefore indirect evidence, and the evidence of experiments on man's nearest anatomical relations alone can be used. However, the evidence that other animals like swine and calves and lambs are frequently infected by milk from tubercular cows is overwhelming and not denied by Koch. In the debate in Koch's paper Nocard, in his remarks, said, "I may remind you of the fact established by your (English) chemist Thornton, and which proves the gravity of the danger. The general mortality in England for tuberculosis has diminished in 50 years by 45 per cent. Only one class of the population shows a contrary tendency, that is that of infants of tender years who die of abdominal tuberculosis. In this class the proportion has *increased* 27 per cent., as compared to a general diminution of 45 per cent. Nothing has been done to improve the sanitary condition of the milch cows and to prevent the sale of milk from those with tuberculous udders." It would seem to me, therefore, that the burden of proof is on Koch's side, and that until he can prove to the

perfect satisfaction of men as skilled in laboratory work and as keen in observation as he is himself that infants are *never* infected by the use of milk from tuberculous cow his case is not won, and that we will be unwise to relax in the least our most stringent rules concerning the sale of the milk and meat from cattle infected with tuberculosis. Under such conditions we can wait with patience until this problem of the intercommunicability of human and bovine tuberculosis is definitely settled.

The *diagnosis* of tuberculous disease in its very beginning is often a matter of great difficulty. After the process has advanced to the production of gross lesions, with their attendant symptoms any one can recognize it. In the meantime the golden opportunity for curative treatment has been lost. In my experience it is not the rule to see a case of tuberculosis at a period so early that it can be rightly termed "incipient." This is due to two reasons: first, to the negligence of the patient himself, secondly, to the carelessness or superficial examination given by the doctor to whom the patient first applies for medical advice for what he considers some trifling departure from health. If we could constantly hold in mind that practically everyone is daily exposed to the tubercular infection and hold under suspicion everyone who applies for counsel who does not present data for a definite diagnosis or who does not show a rapid amelioration of his symptoms, we would not see in the reports from sanatoria the statement that 60 per cent. of applicants sent as suitable for treatment are rejected year after year because their disease had advanced so far as not to give promise of cure. As a matter of fact nature is kinder to us than we are to ourselves or to each other. The reports from the large hospitals in which great numbers of postmortem examinations are made show tuberculous lesions healed or active in at least 50 per cent. of all cases examined macroscopically. Naegeli has reported a successive series of 500 autopsies in a general hospital in which, by the aid of the microscope, he demonstrated the presence of tubercular lesions in 99.9 per cent. of the cases. Welch has said that if such lesions be sought with diligence in all the tissues the proportion will not be found to have been exaggerated by Naegeli. With the universality of the infective principle and the known exposure of city dwellers to it, I do not see how we can escape such a conclusion. The attitude of the physician should be one of expectancy to find the evidence of tuberculosis and he should not rest satisfied in any case under the least suspicion until he has demonstrated beyond the shadow of a peradventure that his patient has or has not a tubercular infection. The cultivated diagnostician will detect the slightest variation on comparative examination of the chest by all the methods known to art. Allbutt has said that he who has not a musical ear should not practice percussion and auscultation in cases in which an early diagnosis is of such great importance. But long before any change has taken place that the most expert in physical diagnosis can possibly detect the invasion has begun in the lungs, and if we await the evidence to be elicited by the usual methods, and particularly if we wait until the sputum reveals the presence of tuberculous bacillus which always means that the process of ulceration has already begun, we have lost most precious time. Again, the invasion is not always by the lungs but frequently enough in the lymphatic glands of the neck or of the mesentery or in other organs of the body and in such cases an early diagnosis by gross methods is once more impossible. Persistent malaise with loss of appetite and strength and later with a daily rise of temperature of a fraction of one degree with pulse of lowered tension and increased frequency and the onset of a slight cough, combine to make the alert physician suspicious of tuberculosis where no physical signs can be detected. I know of no single observation of more value both in diagnosis and prognosis than accurate thermometry. To make such observations of value one must attend personally to every detail. A thermometer of known accuracy must be used under unvariable conditions by a person most interested to record the exact truth. In my experience I have found I can trust the patient to make such observations as I do not make myself with more safety than I can any one to whom his care is entrusted. Not infrequently before the temperature is elevated even a single degree, the pulse will be changed in frequency and character, especially in persons of nervous temperament. With a careful investigation of the history of each case presenting and attention to the significance of the symptoms just discussed, an early diagnosis can frequently be made before any physical signs manifest themselves and before a single tubercle bacillus can be discovered in an examination of the sputum. If that prove impossible modern science has contributed other methods of diagnosis that will absolutely settle the truth. In 1900 Koch once more set the whole world ablaze by another astounding announcement. This time his message fell on the ears, not only of physicians, but of those in the throes of the dread white scourge. Such an assemblage of notable men eager to learn the truth of his announcement of the discovery of tuberculin and its virtues as a specific for the cure of tuberculosis, and such a mob of sick men and women eager to be cured never was seen in any city as gathered in Berlin immediately after the publication of this news. The announcement of his discovery of the tubercle bacillus was done in the most scientific and open manner. The cure, tuberculin, was held as a secret which he did not give to the medical world until the investigation of others in the same field of work practically disclosed it. Its reputation as a specific in the cure of tuberculosis was short lived. However, much good came of it, for it was speedily proven to be the most delicate test by which to prove the presence of tuberculosis in suspicious cases in which a diagnosis by no other means could be definitely asserted. Its use for

this purpose has steadily increased and to-day the verdict of those most expert in the diagnosis of tuberculosis is that it is absolutely reliable and that if properly used, it is never injurious. Koch has modified his original method of producing tuberculin twice ,and now uses what he terms "tuberculin emulsion." This is made by grinding the dried living bacilli for weeks in a mill, then centrifugating the powder suspended in water to throw down any clumps and unground bacilli, then by keeping this recovered product in 50-per-cent. glycerin solution at least two weeks before it is put on the market, which process he claims kills any remaining living bacilli. In the Saranac Laboratory it was proven that his second modification, "Tuberculin Reste," or "T.R.," was capable of producing fatal tuberculosis in guinea pigs, showing that living bacilli were still present in the product sold. A Swiss investigator, Fritz Thellung, has recently published an account of his experiments showing that the specimen of this latest tuberculin emulsion is also not free from living T.B., and caused fatal tuberculosis in guinea pigs. It is evident that care must be taken to exclude the use both of the T.R. and the T.E. tuberculin, and to use for diagnostic purposes only the original tuberculin which is made perfectly sterile by boiling for 48 hours. Concerning the use of this tuberculin for diagnostic purposes I cannot do better than to quote Koch's own words taken from his address at the London Congress in 1901.

"For this (diagnostic) purpose I use the following method. In the first place the patient's temperature is observed for at least one day, or better two, in order to ascertain whether the temperature is below 37° F. Patients whose temperature is above 37° F. are unsuited for the diagnostic application of tuberculin, and ought not under any circumstances to be subjected to the tuberculin test. If the patient is found suitable he receives an injection of tuberculin under the skin of the back in the forenoon; with weak patients one begins with one-tenth milligram; with stronger ones, whose tubercular alterations are probably very slight one may begin with one milligram. If there is no rise of temperature at all, one gives a dose double as large as the first, not on the next day, but on the day after the next; but if there is a slight rise of temperature, only a quarter of one degree, for instance, the dose is not raised, but repeated as soon as the temperature has gone down to the normal level. It very often happens that, though the same dose has been given, the second reaction is stronger than the first. This is quite specially characteristic of the effect of tuberculin, and may be regarded as a quite infallible sign of the presence of tuberculosis. But if the first small dose produce no reaction one gives five and even ten milligrams. For certainty's sake I am accustomed to give this latter dose twice, and only when no reaction occurs do I feel justified in assuming that the case is not one of fresh or progressive tuberculosis demanding specific treatment." Without question this is the most delicate diagnostic method which we can employ to-day. Koch reports its use in 3,000 cases. Evidence of its usefulness has recently been published in a careful paper by Dr. J. D. Madison, who reports 40 per cent. of reactions in 400 women in the Danvers Insane Hospital in Mass., to whom it was given experimentally.

The use of tuberculin for diagnosis is not without its opponents, some of whom have claimed to observe injurious effects. Dr. Trudeau assures me that in all the cases in which he has used it there has never been any but temporary discomfort from the reaction. He is careful never to exceed a dose of 10 milligrams. In discussing the possible dangers from its use Dr. Madison says, "In considering the dangers of tuberculin, it is well to remember that we continue to use chloroform and ether for diagnostic purposes, notwithstanding the fact that many deaths are known to be caused by them; and surely there are few diseases in which an early diagnosis is more important than in tuberculosis." But we have another method of diagnosis, not so delicate and not so easily applied, and, in fact, useful only in the hands of a skilled and trained observer, in the X-ray. Dr. Baldwin of Saranac tells me that with our Fellow Dr. Clifford Mercer they made use of the fluoroscope to a considerable extent during the past two winters and that they found it of value in about 5 per cent. of the cases examined. It may well precede the use of tuberculin and diminish to some extent the number of cases in which tuberculin may prove a necessary test. He who has a constantly expectant attitude of mind, power of accurate observation, trained skill in physical diagnosis and can avail himself of the services of a Weigel or a Williams with his X-ray photographic plates or his fluoroscope, and who, when necessary, can follow the accurate directions of Koch in the use of tuberculin and can accurately estimate the reaction produced, cannot fail to detect tuberculosis in its very earliest manifestations in such cases as present themselves for diagnosis.

The present status of the *prognosis* in tuberculosis shows a marked change from that of twenty years ago. Throughout the world the number of deaths from tuberculosis is gradually decreasing, even with our present insufficient means for caring for the tubercular poor. England heads the list and shows a decrease of 45 per cent. in deaths from tubercular diseases in the last fifty years. In our own State there has been a gradual decline but in no such proportion as is shown by England, though for the past year a death rate of but 2.7 per cent. per 1,000 is shown in Greater New York. That the death rate is still appalling the following figures taken from a recent publication of the commission for the establishment of sanatoria in New Hampshire are proof. An analysis of all the reported cases from 1884 to 1901 showed that from the age of twenty to thirty years the deaths from tuberculosis were 40.72 per cent. of all deaths in that decade of life; from thirty to forty years they were 31.38

per cent.; from forty to fifty years, they were 19.53 per cent. But the reports from modern sanatoria for the treatment of tuberculosis show conclusively that the prognosis is the more favorable in exact proportion to the period at which the cases come under treatment. The earlier the case comes under treatment the better the prognosis. Dr. Trudeau reports that during the years 1897, 1898 and 1899 72 per cent. of incipient cases were discharged apparently cured, while only 17.8 per cent. of advanced cases recovered. Dr. Bowditch, of Boston, reports that, of purely incipient cases, in 79 per cent. the disease was "arrested," while of a total of 201 cases, 42.23 per cent. showed arrest of the disease process. Dr. Weicker of Goerbersdorf stated at the Berlin Congress that 97 per cent. of the cases received in the "initial" stage and discharged as cured in 1896, 1897 and 1898 were at work on Jan. 1, 1899, while on the same date, of those who were classified as "advanced phthisis with destructive process" and were discharged in the same year 77 per cent. were dead. Such figures might be multiplied but these suffice. They all teach the same gravely important lesson, that the prognosis is good or bad according as the patients come under observation and scientific treatment early or late. But there are some other words to be said on prognosis. We have all of us seen cases that have advanced to cavitation that have recovered and have remained well for long periods. I could give several such examples from my own notes of men who are living and working and in whom I demonstrated the existence of cavities of considerable size, 5, 10 or 15 years ago. On the other hand we have all seen cases which we have watched from the first faintest signs of disease or who have had the best opportunities to recover who have gone from bad to worse and have speedily died in spite of all efforts in behalf of their recovery. In a person of good parentage from a physiological point of view, who has inherited a good degree of resistance, there is hardly any stage of tuberculosis in which recovery may not be possible. Of all diseases tuberculosis is the one which is fullest of surprises. The *prognosis* of tuberculosis is thus seen to be generally better than it was 20 years ago, and is the better the earlier the disease is recognized, and put under the treatment which to-day is recognized as the best.

One of the most interesting and important problems is the question of *immunity*. In the light of such reports from the post-mortem chamber as those of Naegeli it is questionable if there be any such thing as natural immunity. Of course those cases were those of city dwellers of the lower classes, but if the perfect specimen of manhood produced under the most favorable circumstances in the country were subjected to similar conditions is there good reason to think that he would go unscathed? The natural tendency to recovery from disease is recognized by all. It is the "vis medicatrix naturæ"—but this is not immunity. The gift of bodily perfection and the wisdom to maintain it are more to be desired than any immunity which science can confer. But few of us have this gift, and more of us fail to keep intact such inheritance as we have, and so the impetus to investigators to find that which shall give the human race immunity from tuberculosis which shall equal that conferred by vaccination against smallpox is not wanting. An immense amount of work has been done along this line and never more than at this moment. The attitude of laboratory workers is that of hopeful expectancy, almost faith, that that which has eluded them so long will shortly be discovered. In 1893 Trudeau published a series of cases which went to show that vaccination of susceptible animals with T.B. attenuated by repeated tube cultures for a number of years protected them from developing tuberculosis when inoculated with T.B. known to be virulent and which proved fatal to unprotected control animals. These guinea pigs died after two years and were then found to be tuberculous, but they had lived two years longer than the controls, and two years of a guinea pig's life would correspond to two decades of the life of a man. In 1894 de Schweinitz reported some experiments giving similar results. Recently renewed interest in the question of immunity has been awakened. In 1901 von Behring conducted a series of experiments on cattle, repeating the work of Trudeau on rabbits and guinea pigs. By vaccination of cattle with human T.B. grown in tubes for a period of six years he has made them apparently immune to virulent bovine T.B., at least they have survived the inoculation, while the control animals succumbed with acute miliary tuberculosis. Pearson and Gilliland have repeated and confirmed von Behring's results on cattle. After a sufficient time shall have elapsed to determine whether this apparent immunity is complete and that the immunizing serum is innocuous and after it shall have proven successful and harmless to animals more nearly allied to man than are cattle, it can then be safely tried on man himself. When the immunizing serum shall have been produced it will be available for therapeutic purposes. Until that glad day shall come we must proceed on principles already laid down, which have proven so successful in the hands of those who use them.

In the *treatment* of tuberculosis there are certain general principles which cannot be too often repeated. The physician himself must first become thoroughly permeated with the truth that tuberculosis is a curable disease, curable more readily the earlier it is detected, but curable, under the most advantageous circumstances in a considerable percentage of cases, in every stage of its expression. This idea has not yet possessed the profession, and in my opinion the present death rate of tuberculosis is greater than it should be from this very fact. I am conscious of no greater responsibility than that which is assumed by a physician with a live conscience who takes upon himself the care of a tubercular patient. When one is inclined to be pessimistic and to feel

that whatever his efforts the battle will inevitably be against him in the end, let him think of Trudeau and his great achievements and of a host of other noble men who have been his patients and his pupils, and of a long list of other men in our own profession who have themselves been tuberculous and to whose untiring and intelligent efforts we owe the present favorable outlook for those once without hope. At a dinner at Denver last summer at which were seated those whose names are familiar to all phthisiotherapeutists I asked my neighbor how many of the physicians at table had come to Denver because of their lungs. After a rapid survey of the company he answered "All but two—and they came because their wives had tuberculosis." Because of the records from modern treatment and because of my personal knowledge that a large number of our own profession who have contributed grandly to the progress of the world of science, have been cured, I wish to emphasize the fact that the first essential for the successful treatment of tuberculosis is an enthusiastic belief in its curability. When you are yourself imbued with this spirit you are prepared to communicate it to your patient. When the diagnosis is accurately made the next duty is to take your patient fully into your confidence. He is to be encouraged to plan a campaign, not a battle, against an enemy who is completely revealed and whose maneuvers can be accurately determined day by day. He is to share your enthusiasm, and he himself is to be on duty to detect each evidence of advance or of recedence. I have never seen anything but good from such a method of procedure. My patients are all taught the nature of their disease, its natural history, all the essential points in the management of it, and they have proven my most reliable observers of temperature and of all data that do not require the special fitness of an educated medical mind. Intelligent obedience to commands that are seen to be based on correct principles is willingly given, while the perfunctory following of orders simply because they emanate from a selected physician lacks spontaneity and soon grow irksome. This feeling of enthusiastic hopefulness and of implicit faith in one's medical adviser has often won the day when all things looked discouraging indeed. It seems to me that this mental attitude on the part of both physician and patient, which is so essential, has become possible only as the result of accumulating evidence, increasing year by year from laboratory investigation and from clinical observation during the past two decades. If it be asked "Is there a cure for consumption?" the answer cannot be "yes" or "no." The verdict of this moment in the twentieth century is that there is no "specific cure" for this disease, in spite of the assertion of many who have access to medical journals and even to the privileges of a Congress for Tuberculosis. If one reads the Transactions of the Congress for Tuberculosis which met in London in 1900, and which is only recently accessible in full in this country, he must be struck by the fact that while the most eminent men in the field of medical science took great parts in this notable gathering, there was no attempt to rule out those who came with a pet fad. Although laboratory investigators have proven the fallacy of every specific treatment that has yet been proposed, by accurate and convincing experiments on tuberculous animals, you will find here papers advocating as specifics "izal," "igazal," "formaldehyde," "phosphate of lime," "natural serum," so-called "antitoxic serum," "urea," the "Crotte method" by which formaldehyde is supposed to be shot through the lungs by the aid of an electric spark, and so on. If tuberculosis were not a laboratory disease and if all proposed remedies had first to be tried on man instead of on animals, and if evidence depended only on clinical observation, we would certainly be at sea. In a disease essentially chronic, which under favorable circumstances tends to recovery, clinical evidence is least valuable. In a recent address by Trudeau on "The History and Work of the Saranac Laboratory for the Study of Tuberculosis," read before the Laennec Society at Johns Hopkins Hospital, he said, "We soon learned that the tubercle bacillus bore 'cheerfully' a degree of medication which proved fatal to its host," and "While they (proposed specific germicides) had no influence on the tuberculous process, they often tended to shorten the lives of the treated animals," and further on, "Neither our serums nor any of those proposed by other experimenters were found capable of saving a tuberculous guinea pig from a fatal dose of tuberculin." In the light of such evidence only the self-deceived or the deceiving could possibly say that a "specific cure" had been found for tuberculosis.

This negative answer to our question disposes of all attempts at treatment directed against the invading host, the tubercle bacilli, but a powerful and affirmative answer comes when we gather the evidence concerning the effects of treatment directed to the host invaded, the infected man. All of the greatly improved results which modern medicine is recording are due to our successful efforts, as Otis puts it, "to develop and strengthen the resisting power of the consumptive until his pulmonary tissue presents no longer a favorable soil for the infecting germ." The essentials of this treatment seem simple—rest, generous feeding, and life in the open air. Do you remember that significant experiment of Trudeau's away back in eighty-six, when he inoculated a lot of rabbits with tuberculosis and consigned one-half of the number to the free life of an island in an Adirondack lake, and the others to a life under conditions as unhygienic as he could devise? The latter were all dead in three months. The lot set free on the island all "recovered or developed only a localized disease."

By rest is meant not only rest of body but rest of mind as well, so that in considering the separation of a patient from his home, his dependency on home friends and the conditions under which he leaves them must be carefully weighed. Homesickness has thwarted many well laid plans, and

worry about the support of his family has destroyed the beneficial effects of the open air treatment in the case of more than one infected breadwinner.

The details of diet need not be discussed. It would be an experience of great value to any physician to dine at one of the recognized sanitoria. The abundance and variety of nutritious and well-cooked food served to patients would illustrate the extent to which hyperalimentation is successfully carried better than any words could do.

The success of the open air treatment has been so marked that many explanations have been proposed to account for it other than the simple use of ordinarily pure atmospheric air. It will be remembered that, when the Adirondack region was beginning to be exploited as a desirable region for the tubercular, Dr. Loomis proposed an explanation for the superior advantages of the forests, asserting that the evergreen trees had the power of converting the oxygen of the air into ozone. I remember to have been much impressed by this explanation, but the relentless experimenter soon disposed of this theory, and ozone was found of no more value than the ordinary admixture of oxygen in the air we breathe. The temperature of the air was then investigated. It was shown that the growth of the tubercule bacillus was inhibited by a temperature above a certain point. As a practical result it was proposed to treat the tuberculous with superheated air. Many interesting devices were made by which this idea could be carried out. Again it was proven that the tubercule bacillus could not grow luxuriantly if the temperature was kept below a certain point. This resulted in the explanation that the great good of the open air was due to bathing the affected area in air at a temperature below that at which it developed readily. The physiologists had always taught that the temperature of the air below the trachea was practically unchangeable by external conditions of temperature, and that the tissues of the lungs did not differ from other tissues in the body in maintaining an unvariable temperature under usual conditions. The laboratory investigator soon settled this question by demonstrating that the temperature of the lungs was not changed by the change in the temperature of the inspired air, and so the conception that the *bacilli inside of tubercles* were chilled by the low temperature of inspired air and so inhibited, or were discouraged by a temperature higher than 100° F. had to be abandoned, though it has died a slow death. In fact man's ability to stand high and low external temperatures had long been considered to be due to such a physiological mechanism that neither high nor low temperatures under normal conditions of the individual could materially change the normal body temperature. The repeated observations that patients did better in winter than in summer in many of the sanatoria was taken to indicate an advantage due to the temperature, but such an advantage is explained by the greater activity of the metabolic processes, calling for a greater consumption of food in winter than in summer, and to the increase of the sense of well-being brought about by an improvement in digestive ability, which brings with it also an increase of reserve power and of resistance. That there is a definite and measurable change in atmospheric conditions from the level of the sea to the tops of lofty mountain peaks is certain, and for ages physicians have made use of this knowledge. That this can be made use of in various cases to the great advantage of patients is unquestionable. The accumulated evidence of the relative curative properties of the pure air of the sea level or of elevated regions is of great significance and needs to be carefully studied by the ærotherapeutist. It has hitherto been taught that the individual who developes tuberculosis is more rapidly cured in a climate marked by conditions different from those under which he developed the disease. I have seen many examples which served to illustrate this fact. The resident of a region low in elevation and heavily charged with moisture has made apparently more rapid advancement in moderately high regions where the air is dry. I have seen several instances of the reverse of this, where individuals who had become tuberculous in the high and comparatively dry climates of the western tablelands have speedily recovered at such a place as Lakewood. But recently the experience of sanatoria at different localities has seemed to indicate that this selection is not of such importance as it has been considered. I am not yet prepared to give adherence to this dictum, but I am convinced that, under favorable circumstances, a tuberculous patient *can* recover in any kind of an atmosphere, provided it is mechanically and bacteriologically clean, and is enjoyed continuously day and night, and I am inclined to think Dettweiler is right in asserting that it is important that a man be cured in the climate in which he expects to carry on his business. This last statement, and its confirmation in the results obtained in local sanatoria for the poor, puts a new phase on the subject. It means that hope can be given to those to whom it is impossible to say that a prolonged residence at far distant places is necessary because for so many such a method of treatment is beyond the limits of the possible. Without attempting a complete discussion of this subject, for which the limits of this paper would be insufficient, let us take up the last of the problems it is proposed to review to-night: *What should we do with the tuberculous poor?* The condition of this class of society is pitiable beyond expression. In the family of the laboring man at least the position of the husband and wife is equal in importance. If the man is laid low, income ceases, if the woman is the victim of disease, the wages are not sufficient to meet the uncommon expenses. The state and the municipality has a duty to them which it has been slow to recognize but which is imperative. The general hospital of cities and towns is shut to the tuberculous poor,

and, on sanitary grounds, this is right. But it is not right that no provision should be made for this class of cases save what is furnished by the hospitals of county poor houses. If these are used they are found to be but places in which the disease may run its course unchecked and without any attempt to make use of the modern treatment of tuberculosis. The most accurate reports from sanatoria for the treatment of tuberculosis show that at least 75 per cent. of the incipient cases can be arrested, and that a larger number than that can be so far restored to health as to return to avocations that will permit of self support. This is an enormous advantage economically to the State. If we compare with this the results obtained in our state hospitals for the treatment of the insane we will find that the outlook for recovery for the cases of incipient tuberculosis is greater than that for the insane.

Through the kindness of Dr. Hutchings of the St. Lawrence State Hospital for the Insane I have been furnished with these statistics:

"RECOVERIES IN THE ST. LAWRENCE STATE HOSPITAL.

| Year Ending. | Original Commitments. | Recoveries. | Percentage. |
|---|---|---|---|
| Sept. 30, '02..... | 264 | 89 | .337 |
| " " '01..... | 285 | 87 | .305 |
| " " '00..... | 268 | 81 | .302 |
| " " '99..... | 300 | 93 | .310 |
| " " '98..... | 281 | 81 | .288 |

"In addition to the above there were discharged in a greatly improved condition, but not actually recovered, the following: 1902, 25; 1901, 29; 1900, 45; 1899, 35; 1898, 37.

"The cases considered as improved were in the great majority of cases able to resume their usual employment but still entertained some peculiarities which would distinguish them from so-called recoveries in whom no mental symptoms whatever remained." This creditable showing for one of our large state hospitals for the treatment of the insane has been accomplished by the State of New York at an outlay for the entire state of no inconsiderable sum as these figures kindly furnished me from the Comptroller's office will indicate: "The amount expended by the state for building, equipping and furnishing the state hospitals for the insane, to September 30, 1902, is $21,605,065.29. For building, etc., Craig Colony for Epileptics, the only state institution of the kind, the amount expended for the same period is $783,776.85. The total number of patients in the state hospitals on September 30 last was 23,265, and in the Craig Colony for Epileptics, 826. The amount of payments by the state, for the fiscal year ending September 30, 1902, for the maintenance of the state hospitals for the insane was $3,777,529.45, and for the Craig Colony for Epileptics, $128,000."

We are proud to be residents of a State which cares for two classes of unfortunates so bountifully and so successfully. I am not in possession of official statements from Craig Colony, but the general impression is that such an institution cannot hope to be curative but only a hospital for detention. That the great good done by such institutions could be more than equaled by the scientific care of the tuberculous poor the following communication recently received from Dr. Vincent Y. Bowditch is convincing: "Most certainly I believe that every dollar expended by Massachusetts for the State Sanatorium at Rutland has been more than repaid, not only by the good done to the individual sufferers from tuberculosis, so many of whom since their stay at Rutland have become wage-earners again and a large percentage of whom have remained to all intents and purposes perfectly well since, but on account of the educational effect upon the whole community in showing what the simple and essential laws of hygiene will do for the prevention and cure of disease. If we can make people wage-earners again, how much more valuable such institutions are than those which are merely resting-places, however essential they may be, for the poor insane and epileptics who are of little or any use to themselves or the community at large. I cannot speak too strongly to express my feeling in favor of the establishment both of sanatoria for the hopeful cases by the State, and also of hospitals in cities and counties for the hopelessly sick, to be under the supervision of the municipal and county authorities." The State of New York has done something. Two years ago, as the result of a movement which this writer had the honor of first proposing in the Medical Society of the State of New York in a paper read in 1896 and which was most ably carried to an issue in 1900 by a symposium on "State Care of the Tuberculous Poor" planned and executed by one of our ex-presidents, Dr. Henry L. Elsner, the State of New York made an appropriation of $100,000 for the establishment of a State Hospital for the treatment of incipient cases of tuberculosis among the tuberculous poor. It was my privilege to observe last week that the cellar had been commenced at the selected site, Ray Brook, four miles from Saranac. Of course this hospital when completed will be wholly inadequate to care for more than a very small fraction of the cases suitable for admission within its walls. But it will mark the beginning of better things to come. If it shall be free from political control and be given to the most scientific treatment of selected cases it will not be long before its records will prove inspirational to our legislators, and from this will doubtless grow a more intelligent policy in the care of all curable cases of tuberculosis. But accessory to State hospitals there must be in every county and near every city of the first and second classes in our State, local hospitals for the tuberculous which shall receive all cases and in which cases can be watched sufficiently long to determine whether they are suitable for treatment in State institutions or whether they should remain permanently in local institutions. Such hospitals must be so controlled as not to be made simply hospitals of refuge to which no self-respecting tuberculous patient would be willing to be consigned; they

must be managed with all the attention to details for curative institutions that modern skill can devise; they must have a corps of medical officers that shall command the respect of the community at large, and they must be independent of the county poor house. To the end that our own city shall soon have a hospital that shall meet these demands, the influence of this organization is necessary. But while we wait hopefully and expectantly for the consummation of this plan, we need not be inactive. The example of the Greater City of New York which has greatly ameliorated the condition of the city's tuberculous subjects and has already effected a marked diminution in the death rate for consumption is before us and is worthy of imitation. The plan conceived and executed by Dr. Hermann Biggs and his coadjutors has proven so comprehensive and so successful that it has had the favorable commendation of the great Koch himself, and, until more perfect measures can be carried out, it should receive our earnest study. This Academy should support our local Board of Health which has undertaken to carry out most commendable provisions, particularly those which aim at the education of the people in a correct knowledge of what tuberculosis is and how it can best be avoided and prevented. In the campaign of education the local authorities might well invoke the cooperation of all sick benefit societies, industrial insurance companies and all large manufacturing con-

At the risk of imposing upon your patience I have gone over superficially some of the most important of the problems of tuberculosis. No attempt has been made to treat any topic exhaustively, and only those most needing emphasis have been touched upon. It is only by repetition of such well-known facts as have been here gathered together that we can awake in the public and in the profession a proper appreciation of the importance of a subject that has become so familiar to us that it has almost "bred contempt." This awakened interest would be manifested most effectively by the establishment in every city of a Society for the Prevention of Tuberculosis.

## MEDICAL PROGRESS.

### OBSTETRICS AND GYNECOLOGY.

**The Treatment of Gonorrhea of the Uterus.**—This depends on the situation and chronicity of the disease; according to the judgment of GEORGE W. NEWTON (Am. Jour. of Obstet., May, 1903), it is difficult to destroy the gonococci in the uterus as the ducts of the Nabothian glands of the cervix furnish a most excellent hiding place and that it is difficult to get at them with either drugs or the curette. They may also have penetrated the muscular structures so that it is impossible to reach with the curette. When the disease is limited to the cervical canal the discharge should be removed with the author's brush. This brush will remove the tenacious discharge in a second's time most perfectly. Then to the membrane which lines the cervix, a mixture containing 40 per cent. of carbolic acid and 60 per cent. of iodine should be applied with prepared cotton on an applicator, care being taken that none of the mixture goes beyond the internal os. If there is much erosion about the external os after making the application of iodine and carbolic, a tampon wrung out in one per cent. creoline should be inserted into the vagina, and the patient should use daily douches of creoline. The applications to the cervix should be made twice a week. After the disease has gone by the internal os the treatment varies with the chronicity of the disease. If the gonorrheal process is subacute put the patient to bed, prepare her as carefully as if she were to have a hysterectomy performed, dilate the uterus carefully but thoroughly, then flush the uterus with two quarts of sterilized water; follow this with a few ounces of a one-per-cent solution of protargol, then lightly pack into the uterus gauze saturated with two per cent. protargol. Allow this gauze to remain in the uterus for twenty-four hours, at the end of which time it should be removed. If the disease is chronic exactly the same procedures should be carried out except that the uterus is curetted with a sharp curette. It cannot be stated at the present the exact percentage of the cases of gonorrhea that can be cured by these methods of treatment. Six cases treated by the author after this fashion have been apparently cured as the secretions from the vagina and uterus failed to show the presence of the gonococcus. Six months after they had been operated upon, the symptoms had also disappeared.

**Treatment of Cancer of the Cervix by the X-ray.**—Of all the conditions which the gynecological surgeon is called upon to treat or operate upon, there is none quite so terrible as, or more painful in all its manifestations, than cancer of the uterus and its appendages; furthermore there is no condition where the major proportion of the cases finds us so helpless or powerless to bring about a radical cure. THOMAS P. SCULLY (Ann. of Gyn. and Ped., May, 1903) says that during the past year several men have been investigating the use of the X-ray in such places within the body as the rectum and vagina; and, while each was still unaware of the other's endeavors, all have arrived at practically the same conclusion as to the manner in which the X-rays could be used successfully. E. W. Caldwell of New York City has described a specially constructed tube for this purpose. It is a unique contrivance and certainly has many excellent features to recommend it. Prof. Pennington of Chicago, has devised a shield of metal which is clasped around the X-ray bulb; this shield has a cylindrical prolongation which can be used as a speculum or to which a speculum can be attached, and through which the rays are concentrated on growths in the rectum and vagina. The author reported three cases of cancer of the vagina in which he had employed the X-ray treatment in all of which there had been some varying degree of success, and states that at the present time in certain cases of cancer of the cervix, nothing short of complete removal should be attempted, but in the later stages of the same condition where the vaginal vault is involved and also the body of the uterus, it is highly improbable that more than temporary relief can be given the patient by surgical means, it would certainly seem that the X-ray treatment should be resorted to.

**Rational Treatment of Puerperal Infection.**—The opprobrium of our twentieth century medical science is the inconsistence of our teaching and practice regarding the prevention and treatment of puerperal infection, remarks H. G. WETHERILL (Am. Jour. of Obstet., May, 1903), for while its pathology and etiology are known the proper methods of prophylaxis for its control are not practised. The remedy at hand is the application of truly surgical methods to obstetrical procedures as in other surgical operations. Confinement in hospitals

should be advised, especially for those in moderate circumstances, with whom the proper aseptic handling is almost impossible at their homes. This will not only minimize the risks from sepsis, eclampsia and all other forms of dystocia, but all possible complications which may arise may be comfortably handled there by the surgeon. This writer insists upon the use of rubber gloves and fewer vaginal examinations as the true method of prophylaxis. The uterine curette does a vast amount of harm in all varieties of true septicemia, through the dissemination and distribution of the infectious material, and the opening up of new areas of absorption. The administration of an anesthetic adds not a little to the seriousness of curettage in that it gives extra work for a kidney already taxed to its limit. When the pulse is over 120 the patient should not be given an anesthetic. Of the vaginal and intra-uterine douches, but little need be said. The antiseptic solutions ordinarily used may do some good, but are capable of doing great harm if injudiciously or unskilfully used; we now possess better, safer, and more easily applied means to the same end. Antistreptococcic serum is mentioned, to be condemned along with unguentum Credé. Laxatives and purgatives are condemned as they weaken the patient, whereas the object to be sought for is one of stimulation. Whisky, caffeine, spartine, digitalis, quinine, are all valuable as sustainers, as is also adrenalin chloride, and may be used in conjunction with the other lines of treatment. The best results are to be obtained through the rigid application of the same methods as are employed in other intra-abdominal infections, with the additional use of drainage tubes and the intra-uterine irrigations of alcohol as advocated by K. Carossa, in 1896, and first brought to the attention of Americans by Dr. Ed. J. Ill of Newark, N. J., in 1897. Tubes and gauze may be left in situ from two days to two weeks, being kept free from obstruction with débris by the strong action of a good piston syringe. As to the results of the method, the author compared them to those witnessed some years ago in diphtheria from the use of antitoxin, for if it be instituted sufficiently early, that is, before general sepsis and diffuse peritonitis are established, the temperature, pulse and general expression of the disease were rapidly altered for the better, and even in one desperate case of general sepsis, with extensive embolic pneumônia and diffuse peritonitis, the patient recovered.

**Degenerations and Complications of Fibroid Tumors.**—The classical teachings concerning the life history of these growths, their degeneration, complications and dangers are far from correct, hence C. P. Noble (Am. Gyn., April, 1903) urges the necessity of a more careful study of these growths in order that they may be dealt with from a more scientific basis rather than from the old traditional standpoint. In estimating the risks encountered by patients suffering from fibroid tumor, there should be considered first those growing out of complications, which will be classified as follows: (1) Those which would lead to a fatal result; (2) those which would threaten the life of the patient; and (3) those which would involve more or less invalidism. It is difficult to estimate the number of patients that would die from the effects of hemorrhage: chronic anemia leading to degeneraton of the heart and kidneys; to pressure of the tumor on the ureters and bowels; to malnutrition induced by hemorrhage and by the increase of intra-abdominal pressure interfering with the functions of the alimentary canal; to the lowered vitality of the patients increasing their liability to intercurrent diseases; to septicemia from necrosis of the tumors; and to thrombosis through the associated phlebitis and to the subsequent degeneration of uncomplicated tumors. To these must be added the risks of pregnancy and parturition when complicated by fibroid tumors. Of 100 intra-abdominal operations performed by the author, 46 were unchanged fibromata, 2 showed telangiectatic changes, with non-encapsulation and abnormal diffusion through the muscle,and 52 presented pathological degeneration, 27 edematous or myxomatous, 1 myxosarcomatous, 5 cystic or fibrocystic, 1 calcareous and 18 necrotic. Pain, as a predominant symptom, is thought to be an indication of degeneration, it having been noted in two-thirds of the necrotic cases, in three-fifths of the cystic cases and in one-third of the myxomatous cases. The age of the youngest patient operated upon was twenty-three years, the oldest sixty-three and the predominance of cases was between the ages of thirty-five and forty-five years. An analysis of 668 cases of fibromata in the hands of four surgeons shows a mortality as follows: Martin, 16 per cent.; Noble, 16 per cent.; Frederich, 23 per cent.; Cullingsworth, 24 per cent. These are cases in which there was degeneration or complication without operation. No instance of a fibroid having disappeared after menopause has come under the author's notice. One case, seen fifteen years ago, was said to have lessened after pregnancy. It is a conservative statement that one-third of the women having fibroid tumors will die if they are not operated upon. The mortality from myomectomy varies between 2 and 10 per cent. depending upon the operator, the gravity of the case, the environment and upon the operation performed. It seems a fair conclusion that those resorting to an early operation will save from 30 to 35 per cent. in mortality. It seems to the author that the attitude of the text-books should be changed or reversed, and the rule should be to remove all fibroids that come under observation, unless, in a particular case there seems to be reason for temporizing, either because of the small size of the tumor or the advanced age, or to the general health of the patient.

**Veratrum in Puerperal Eclampsia.**—In this disease the convulsions occur very suddenly and without warning. The patient may suddenly cease speaking, the eyelids begin to twitch, the eyes become fixed or roll from side to side, the muscles of the face or the extremities jerk. The tongue may be badly bitten, the muscles of respiration may be involved in the spasm. The face is bloated, dark-purple, the features distorted, and the picture is a terrible one for the beholders. One attack follows another in quick succession. If dropsy occur or albumin appears in the urine during a pregnancy the patient should be kept in bed on a milk diet. Basham's mixture may be given with advantage. When the convulsion occurs there are two indications: elimination of the poison and sedation. The plan of J. S. Hammond (Ann. of Gyn. and Ped., June, 1903) is to control the convulsion by chloroform inhalation, give a hypodermic of 10 to 15 drops of tincture of veratrum viride, and examine bladder and rectum. Repeat the veratrum every twenty minutes till the pulse is below 60. The veratrum acts as an emetic and diaphoretic, and, in addition, the bowels may be moved by one-quarter grain of elaterium mixed with butter and placed on the back of the tongue, or by two or three drops of croton oil in a teaspoonful of olive oil. Hypodermoclysis will promote diuresis. Obstetric interference is not justifiable, for though the child may be the predisposing cause of the eclampsia it is not the exciting cause, and the hurried operation only adds to the existing toxemia, the dangers of irritation and traumatism. Leave delivery to nature whether the child is dead in the womb or not.

**A New Speculum**—An example of the villainies of special instruments is furnished by a new self-retaining vaginal speculum, suggested by S. Spiegel (Centralbl.

f. Gyn., June, 1903). Without describing the details of the device, it is sufficient to point out the one feature which the inventor thereof seems to have totally forgotten. It consists, briefly, in a speculum which is fastened rigidly to the table by a series of arms and clamps. It would need only a struggle on the part of the patient during imperfect anesthesia, to do herself incalculable damage. It is really strange that ingenuity enough to devise such an apparatus should not be accompanied by common sense to see that the dangers far outweigh the advantages of the invention.

**Ectopic Gestation.**—Formerly considered to be a very rare condition, the trend of modern thought is toward the opinion of an almost constant relation between ectopic gestation and pelvic hematocele. J. H. Stealy (Am. Gyn., May, 1903) believes that the trouble lies chiefly in the different views on the relation between these two troubles. If most of the blood extravasations in the pelvis are to be considered to be the effects of tubal pregnancy, then, indeed, the cases will be found to be very numerous. The only right that we have to call a pelvic hematocele a result of an extra-uterine pregnancy, is the absolute identification of decidual cells or chorionic villi, or the presence of a fetus. In a disappointingly large number of women it is impossible to get any suggestive history that might help us in solving the problem of etiology. And in the consideration of this question the author assumes as facts, a priori, that: (*a*) impregnation normally occurs in the fimbriæ of the tubes as shown by Strassman, Mandl, Hofmeier, Heusen and others; (*b*) the ciliary currents are downward from the fimbriæ to the cervix, as stated by Kelly; (*c*) the denudation of the epithelium of the uterus or the tubes is not necessary to the implantation of an ovum (Dudley). The more the subject is reviewed the more evident is the fact that we can lay at the door of no cause the fault of this condition. Broadly stated, any condition which absolutely prevents the egress of the impregnated ovum from the tube, or delays its passage until by its rapid growth it has become too large and heavy to be moved by the action of the cilia and the peristalsis of the tube, is a condition favoring tubal pregnancy. These conditions may be extrinsic or intrinsic, or acquired or inherited. The woman may have all the signs of pregnancy except the absence of her menses, and this should put us on our guard; or she may state that her menses had stopped for a month or so, and that she considered herself pregnant, when upon the re-establishment of the flow she believed herself mistaken. The symptoms of tubal rupture and abortion are those of pelvic hematocele and consist of all the evidences of severe internal hemorrhage and shock. When the rupture be into the cellular tissue of the broad ligament, the pain and shock will be intense. If a small vessel alone be lacerated the fetus may die and the patient go on in perfect health with a diagnosis of colic. In general, we may say that the etiology, signs, symptoms and treatment are as follows: Cases of ectopic gestation are by no means infrequent, and are among the most serious conditions with which we have to cope. Generally they occur in those near middle life, having a previous history of sterility. The symptoms that are to be carried in mind are: (1) The woman will have missed a period; (2) colicky pains; (3) bloody discharge from the vagina or an irregular continuation of menstruation, often leading the woman to believe herself pregnant. With few exceptions and these are dependent only on the woman's welfare, the indication for immediate operation in these cases is absolute. No case of "colic" in a woman capable of procreation, more especially one married, should be allowed to pass unscrutinized, without the thought of ectopic gestation in mind. And to be emphasized a thousandfold, is that no such symptom in a pregnant woman should be lightly regarded. Even though in many hundred cases, as it will be, our care results in nothing but a transitory diagnosis that passes through our minds, yet some time, to some woman, it may mean her life.

**Gonorrheal Puerperal Fever.**—In summarizing the chief essential points regarding this condition, Fred. J. Taussig (Am. Gyn., April, 1903) gives the following as the most important. The gonococcus is the etiological factor in about one-sixth of all cases of puerperal infection. Although secondary to a gonorrheal infection elsewhere, this trouble involves an infection of the puerperal wounds; and hence must be classified under the head of puerperal fever. The gonococcus may gain access to the uterine cavity without any internal examinations being made. Many a case of so-called autogenous infection may be explained in this way. More frequently the process is brought about by digital manipulations and operative procedures, particularly intra-uterine, in the delivery of the child and the placenta. The infection shows itself about the fifth or sixth day postpartum, by rigors, a temperature of 103° F., and a severe abdominal angina. The fever is usually of short duration, and the further course of the disease is mild, but liable to become chronic. The cases in which the temperature begins to rise as early as the sixth day, and runs up to 103° F. or more, are not necessarily caused by a mixed infection, as Baum and others hold, but are due to the gonococcus alone. The diagnosis is based on the rather late onset, the slow, regular pulse, the moderate and steady elevation of temperature, the profuse purulent, glairy, discharge, and, above all, by the presence of the gonococcus in the lochia. The prophylaxis is of more benefit than treatment. All pregnant women having gonorrhœa should be delivered without internal examination. Treatment should be limited to one or two intra-uterine douches, frequent vaginal irrigations and rest in bed for a prolonged period of time.

**Accidental Perforation of the Uterus.**—This accident is of far more frequent occurrence than is commonly believed, according to Abram Brothers (Am. Gyn., April, 1903). Cases occurring in the hands of midwives, professional abortionists and ignorant persons generally, in the effort to interrupt pregnancy, are frequently seen by physicians connected with public hospitals, consultants in gynecology, and the medical assistants of the coroner's office. But the large majority of cases which occur in the course of legitimate work and in the hands of honest practitioners of medicine never see the light of day because of the fear of criminal prosecution, or, at least, of public ridicule, even cases which do not go on to fatal termination. As a matter of course and fact, the author is convinced that it is the rare exception that uterine perforation ends fatally. In the treatment of these most unfortunate cases we must consider them in groups or sets. The first set of cases are those in which, during the passage of a sound or curette, the uterus is perforated. These cases will usually get well if manipulations are immediately brought to a close and if no irrigation is employed, intra-uterine in nature. If the uterus has been injured and the operator has irrigated the uterine interior, three sets of conditions may arise. In the first set a mild peritonitis (local) may call for nothing more than the same line of treatment. In the second set an acute septic peritonitis may call for an immediate hysterectomy (usually vaginal) with drainage per vaginam. The third set may be less virulent and more chronic. They are apt to terminate in localized abscesses which may be located in the pelvic tissues or in the pelvic

peritoneum. The operation in the majority of these cases will be in the nature of an exploratory laparotomy. In those cases in which the uterus has been injured and the intestine has been dragged through the wound, laparotomy must be done as early as possible. If the strangulation has been fatal to the vitality of the gut it must be exsected at once. The uterus may then, according to the judgment of the operator, be repaired or removed. Miqual reports five such cases, which were not fatal. Hysterectomy and curettage should be less resorted to in the large proportion of these cases, and recovery will be increased in percentage ratio.

**Vesicofixation of the Uterus.**—Retrodisplacement without adhesions, persisting after earnest and careful treatment and producing symptoms such as backache, dragging sensations and neuralgia, increased by slight exertion, as walking, chronic constipation and intense dysmenorrhea, are, according to N. J. Hawley (Am. Gyn., May, 1903) best relieved by vesicofixation. The operation is not contraindicated by the presence of a hymen. It is far superior to the Alexander operation in that it allows inspection and thorough examination of the adnexa. Endometritis, which usually accompanies these cases or any other existing abnormalities of the external genitalia, can be treated and relieved at the same time, thus obviating a second operation or the inconvenience of changing position necessitated by abdominal section. The lessened danger to the patient, shorter time in bed and absence of visible scar should also be taken into consideration. After the patient has been carefully prepared for the operation in the usual manner, the following steps are to be taken in performing the vesicofixation. With the posterior retractor in place, the cervix is grasped in a double volsella and drawn down as far as possible and the uterine sound passed to note again the exact position. A tenaculum forceps or Senn's forceps now takes hold of the anterior wall in the median line and stretches it out and away from the cervix. The incision is started just below the forceps and 4 or 5 cm. away from the cervix, extending to the latter and down to the bladder-wall. The vaginal mucosa is now dissected back on both sides, a distance of 2 or 3 cm., and also separated from the bladder where it joins the uterus. This union is divided with the knife or scissors and the bladder quickly pushed off and away from the uterus with the finger or a sponge on a forceps. The hemorrhage ensuing is slight and easily arrested. When the peritoneum is reached it is better to continue the pushing and separate the peritoneum well back from the top of the bladder before opening it in front of the uterus. After opening this membrane transversely, the vesical portion is seized by forceps and held forward, while two fingers are introduced for exploration. A long Pean's retractor is now inserted anteriorly to press forward the bladder and peritoneum, the cervix is released and pushed upward while the body of the uterus is grasped with two-pronged tenaculum forceps as high as possible and drawn forward. Another pair of forceps are applied higher up, the first removed and this continued until the fundus uteri appears at the peritoneal opening. Upon pushing the fundus to the right, the left tube and ovary may be drawn down and inspected, and likewise the opposite side. With the fundus held firmly by the forceps and drawn down, the peritoneum from the bladder is brought back and over it as far as possible, where it is sutured between the tubes with a fine continuous chromicized catgut and any excess of peritoneum removed. The edge of the bladder, first separated from the uterus, is stitched high up on the anterior surface of the uterus and with a single chromicized mattress suture. The two edges of the vaginal wound are now carefully approximated with interrupted catgut sutures, passed just deep enough to exclude hollow spaces. The bladder is catheterized and a loose vaginal packing of plain gauze is inserted. The object of the operation is to leave the uterus in an easy position of slight antiversion, therefore care should be exercised not to suture the peritoneum too far back upon the uterus; likewise, vaginal fixation is not applicable to these cases unless after menopause, and should be resorted to only for complete prolapsus.

**Puerperal Hematoma** is of very rare occurrence and it would require the aggregation of several hundred cases of labor to arrive at the exact truth of its frequency, according to H. R. Coston (Am. Jour. of Obstet., April, 1903). The predisposing cause is the engorged condition of the pudendal vessels and the strain put on them by labor; and to this may be added any pathologic condition of the vessels, such as sclerosis and varicosities. The exciting cause in most cases is the pressure of the fetal mass on the soft parts of the mother. The use of forceps or other instruments; symphyseotomy, or spontaneous separation at the symphysis pubis; the rapid delivery of the after-coming head; or the accidental striking of the parts against a hard substance. The vast majority of cases occur during labor, though it may take place after labor is terminated. When it is caused by injuries during labor, such as sneezing, violent coughing or the act of quickly sitting up in bed, has caused to dislodge a thrombus, and thus bleeding takes place. It may occur in any position, though usually it is in either of the labia majora. If the effusion occurs above the pelvic fascia it forces itself upward; if below the pelvic fascia it dissects toward the vulva. Pain may be more severe in a small hematoma that is stretching the skin, than in a large hematoma which is subperitoneal. If the amount of blood lost is great, there will be present, besides the signs of hemorrhage, pain proportionate to the amount of the hemorrhage and to the location of the blood. To the eye, the tumor is blue or bluish black in color, depending upon whether it is under the skin or mucosa. Should a hematoma rupture while the hemorrhage is in progress—especially if it should rupture intraperitoneally, all the symptoms of hemorrhage would rapidly increase, and unless the attendant quickly made use of radical measures, the patient would soon bleed to death. Should the hematoma become infected, there would be symptoms of suppuration added, with the production of metastatic abscesses. The condition of hematoma must be diagnosed from varicose veins in the vulva, hernia, inversion of the uterus, or vagina, blood clot, the placenta, or a fecal mass in the rectum. Formerly, hematoma was regarded as a very serious trouble, the death rate being from 20 to 40 per cent. In this day of asepsis it should not reach seven per cent. In all cases the bowels must be kept open; the diet must be light, but nutritious; the woman must have stimulants, tonics and alteratives as the case demands, always remembering to keep the stomach in a healthy condition. The skin and kidneys must be watched for septic processes. In failure of nutrition, in long continued cases, some preparation of malt or beer are to be recommended. Those cases occurring before delivery will receive the same treatment as those afterward, except that it may be necessary to incise the tumor to remove the obstructing mass.

**Cystic Bladder Mistaken for an Ovarian Cyst.**—With the diagnosis of an ovarian cyst, a colored woman, about forty years of age, was admitted to the wards of Enrique Fortune (Am. Jour. of Obstet., April, 1903). There was a tumor of the abdominal cavity, cystic in character and about the size of a man's head,

There was bulging of the tumor in the lower abdominal segment, and it was centrally located. Its relations with the uterus could not be appreciated. It was somewhat movable. Diagnosis of ovarian cyst was made. There was repeated frequent micturition of small quantities, but the total amount excreted was normal. Operation was decided upon, and on opening the abdomen the cyst came into view and all efforts to withdraw it were ineffectual. Incision into the cyst brought forth a watery liquid. The internal surface of the cyst seemed so much like that of the bladder, that an assistant was instructed to catheterize the patient. A small amount of urine, bloody in character, and this with the fact that the catheter could be felt beneath the hands of the operator, assured him that the tumor was of the bladder. On a second catheterization of the bladder, the lip of the catheter was brought out of the abdominal wound. The lacerated portion of the vesical sac was resected with scissors and then sutured in two continuous planes. The abdominal wound was closed without drainage and a self-retaining catheter was introduced into the bladder and left there for nine days, after which time the urine was voided naturally and spontaneously. There was no urethral or vesical irritation. Convalescence was rapid. Inasmuch as the uterus was found to contain a large fibroma and hysterectomy was necessary, it was evident that the bladder was bent and compressed by the fibroma; the superior portion communicating with the inferior one, emptied itself incompletely until the time when the exaggerated flexion of the bladder shut it off entirely from the lower portion, thus establishing a permanent cyst. As the ureters voided into the lower portion of the bladder, no derangement took place other than the frequent micturition due to the reduced capacity of the bladder. The urine contained in the cyst lost its characteristics as a hydronephrosis, becoming watery.

## PHYSIOLOGY.

**The Irritability of the Brain during Anemia.**—When the brain is subjected to anemia by the process of perfusing solutions, such as Ringer's solution, its functions soon cease, according to W. J. GIES (Amer. Jour. of Physiol., May 1, 1903). When anemia is induced rapidly, convulsions ensue. When gradually induced, anemia may be made acute without causing the appearance of convulsions. When anemia is produced gradually, the functions cease usually in the following order: (1) In cold-blooded animals: respiration, skin reflex, lid reflex, nose reflex, heart beat. (2) In warm-blooded animals: lid reflex, respiration, nose reflex, heart beat.

**The Growth and Histogenesis of Nerves.**—There are four stages in the development of nerves, according to C. R. BARDEEN (Am. Jour. of Anatomy, March 28, 1903). They are as follows: (1) The differentiation of motor nuclei and sensory ganglia. (2) The outgrowth from the central nervous system to various peripheral anlages. (3) The development of branches from the principal nerves, etc., various parts differentiated from these anlages. (4) The development of functional unity between the nerve fibers and the structures to which they are distributed. The proximal nerve plexuses are formed during the second period, the coarser peripheral plexuses during the third, and the finer peripheral plexuses during the fourth period. During the last three periods there may be considerable shifting in relative position of the structures to which the nerves are distributed. The union of nerve and muscle fibers takes place before the formation of the sarcolemma. The terminal apparatus of the nerve is more resistant to digestive fluids than the muscle substance, and is closely attached to the under surface of the sarcolemma. The sheaths of the nerves serve to maintain the stroma in which the axis cylinder fibrils grow. Myelinization is due to influences exerted by the axis cylinder fibrils on the surrounding stroma.

**Oxalic Acid and Oxaluric Acid in the Urine.**—There frequently occurs, according to A. M. LUZZATTO (Hoppe Seyler's Zeitsch. f. Physiol., Vol. 37, No. 3), in the urine of dogs and in small amounts in human urine, a substance which on boiling with hydrochloric acid, yields oxalic acid. This substance in all probability is oxaluric acid. The addition of ammonium oxalurate to human urines does not produce, even after a long interval, a sediment of calcium oxalate. This argues against the hypothesis that the occurrence of this sediment in urine depends upon the presence of oxaluric acid. Under certain, as yet unknown, conditions, less oxalic acid is found in urine boiled with hydrochloric acid than in unboiled urine, a circumstance of practical importance in the technic of the determination of oxalic acid. The administration of uric acid produces no noteworthy increase in the elimination of oxalic acid. One need not conclude, however, that oxalic acid is not formed in the organism out of uric acid, since it might be formed by the oxidation of the latter. Oxaluric acid is changed in the animal's body into oxalic acid and completely oxidized.

**The Lecithanes and their Physiological Significance.**—The group of bodies extracted from brain-substance, including lecithin, cephalin, myelin and others, and now classed under the name "phosphatids," should, according to W. KOCH (Hoppe Seyler's Zeitsch. f. Physiol., Feb. 5, 1903) be included under a general group which he calls "lecithanes." These are defined as waxy hygroscopic substances which are built up out of orthophosphoric acid, the higher satisfied and unsatisfied fatty acids, nitrogenous groups and glycerin. The author's investigations have led him to the conviction that the physical as well as the chemical properties of the lecithanes are of great significance for the life of the cells. The capacity of lecithin to mix with water, has been known for a long time. With water it forms a colloidal solution that cannot penetrate parchment paper. It is not precipitated by the univalent kations of Na, K, $NH_4$, Li and Ag, even in concentrated solution. The salts of the bivalent kations Mg, Ca, Si, Co, Ni, Fe″, Zn, Cd, Cu and Pb produce a gelatinous precipitate. The salts of the trivalent kations act like those of the univalent; they are the salts of Fe‴, Al and Au. The anions Cl, Br, I, $SO_4$, Citrates, Oxalates and Ferrocyanides behave like the univalent kations. The non-electrolytes, albumins, peptones, glucose, urea alkaloids like caffeine, aconitin and strychnine and narcotics like urethan and chloral, have no effect on the solution. Chloroform is emulsified in the presence of the colloidal solution. Very remarkable is the influence of the univalent and trivalent kations upon the precipitation brought about by bivalent kations. In the presence of a slight excess of Ca, only a small amount of Na is necessary to inhibit the precipitation. All the above facts indicate that, as regards lecithin, it is not a question of chemical reactions but one of precipitation phenomena, probably of electrical nature. If the life of a cell depends, as Quincke and Loeb maintain, upon the condition of the colloids or their viscosity, it may then easily be seen how the antagonistic effect of the precipitate-forming calcium upon the dissolving sodium, would produce the correct viscosity necessary for a living cell. Too much sodium or too much calcium disturbs the equilibrium and the cell ceases to live, and the addition of the correct amount either of calcium or of sodium, renders possible the continuance of the life-process. The observations made by Mathews

on the effects of anions on motor nerves afford an inexplicable contradiction to the absence of any influence of anions on the solutions of lecithin. As regards the chemical properties of the lecithanes, one may look upon the constituent unsatisfied fatty acids and the nitrogenous group as those portions of the atomic complex that take part in the metabolism of the cell, the former being related to the oxidative processes. The nitrogenous group of lecithin is, according to Halliburton, of physiological significance, since, in certain diseases of the nervous system (*e.g.*, paralysis) large quantities of cholin pass into the cerebrospinal fluid. The fact that cephalin unlike lecithin has one methyl group, indicates that the former is probably an intermediate metabolic product of the latter.

## HISTOLOGY, PATHOLOGY AND BACTERIOLOGY.

**The Medicolegal Tests of Blood Stains.**—The identification of human blood stains has become one of the chief problems of forensic medicine. All differential methods are along two lines, tests based upon microscopic findings, and those based upon processes which may be based upon test tube reactions. Some further confirmatory experiments with the serum tests have been made by E. N. Layton (Am. Med., June 6, 1903). The serum was secured from rabbits. The author believes from his experiments, which cannot be detailed here, that the reaction observed is caused by the development within the blood serum of the injected animal of an antibody or a property or substance which causes a certain reaction with the serum homologous to the one injected. The reaction does not occur when normal rabbit serum is used. The reaction occurs much more rapidly, especially when dilute solutions are used, if the test is exposed to a temperature of 37°C., although it will occur at ordinary room temperature. Only the minutest stain and a single drop of the test serum is necessary for making the test, and its delicacy is not altered by the admixture of other bloods or of foreign material, except the albumin precipitates, nor by the age of the stain. A differentiation from monkey blood is possible by great dilution of the blood tested and a dilution of the test serum of 1-500, with incubation; also by a great dilution of the blood tested, the test serum being used pure at room temperature. The test is specific, invariable, and therefore applicable to forensic use. No difference could be detected in the reactions between the blood of white and colored persons.

**Roaches as Conveyors of Typhoid.**—A localized epidemic of typhoid fever in Chicago was believed to be due to the portage of infectious material by the ordinary cockroach, according to the statement of R. Engelmann (Medicine, June, 1903). Investigation of the large apartment house in which the epidemic occurred, showed certain apartments overrun with these vermin and here the cases of typhoid were found. When the roaches were completely exterminated no further cases developed. The author recommends in all cases that sulphur fumigation is indicated as supplementary to formalin disinfecton.

**The Bacillus of Typhoid in the Blood.**—A series of blood cultures have been made upon typhoid fever patients to determine the relative frequency of the bacillus of that disease in the blood, by Herbert Fox (Proc. Path. Soc., Phil., May, 1903). The blood was taken from undoubted cases from the median basilic vein by aspiration and mixed with agar-agar. In this way fourteen cases were examined and the results of the cultures showed the *Staphylococcus epidermidis albus* present in five cases, this and the *Staphylococcus pyogenes albus* in one, the *Bacillus typhosus* and the *Staphylococcus epidermidis albus* in one, the *Bacillus coli communis* in one, a spore growing bacillus, probably air contamination, in one, and absolutely sterile plates in four, save for mold. The culture which showed the *Bacillus typhosus* was made at the end of the second week and did not appear until four days after the plate was made. To the late day at which the cultures were made may be attributed the fact that the bacillus was not found more often. The frequency of the other forms must be attributed to the imperfect sterilization of the deeper layers of the skin.

**The Effect of Small Amounts of Infectious Materials on the Blood.**—The injection of a very minute quantity (1/300 part of a "loop") of a living twenty-four-hour typhoid culture into the veins of a rabbit was shown by F. Freymuth (Deut. med. Woch., No. 20, 1903) to exert a marked specific action on the blood. This shows how a very slight infection may have a most harmful influence on the blood-forming apparatus and may also explain how many chronic anemic conditions may depend for their continuance on a steady resorption of minute quantities of bacterial toxins.

## THERAPEUTICS.

**The Value of Theocin as a Diuretic.**—This lately introduced diuretic remedy has been compared in a series of clinical tests with agurin, diuretin, and a number of other drugs, by H. Kramer (Münch. med Woch., March 31, 1903). The cases were all marked by ascites or general edema and the drug was given in five grain doses, three to five times daily. The effects were noticed quite soon after administration, from less than one to six hours. The maximum effect was observed on the first or second day of the administration, and as long as it was continued no diminution was seen of its effects. The blood pressure did not appear to be influenced in any way and no disturbances of the nervous system were observed. The only unpleasant after-effects were frequent nausea and vomiting. The author concludes that the remedy is a valuable and rapidly acting diuretic which rarely fails and is more powerful than either agurin or diuretin. It is desirable, however, to attempt the making of a preparation which shall be less productive of nausea and vomiting.

**Potassium Iodide in Migraine.**—The employment of this drug in many cases of so-called sick headache is highly recommended by J. R. Clemens (Therap. Gaz., May 15, 1903), who uses it to the exclusion of all other remedies. He was led to its administration by the observation that a great similarity existed between migrane and cerebral syphilis, the headache of both being characterized by pain that is deep-seated, constricted, of great intensity, with nocturnal exacerbations, long durations, and relapses. There is also present raised arterial tension. The author found that in the most aggravated cases, potassium iodide in 5 to 15 gr. doses, three times daily, diminished both the frequency and severity.

**Value of Alcohol in Infections.**—A preliminary note on some experiments to determine whether alcohol does good in infections by increasing the bacteriolytic power of the blood, is published by H. A. Hare (Therap. Gaz., May 15, 1903). The experiments were conducted in typhoid and also in a number of chronic cases, including nephritis, tubercular peritonitis, etc. It is apparent from the results obtained that the use of alcohol seems to have the power of combating infectious diseases by increasing the bacteria-desrtoying power of the blood. As far as they have gone, the experiments indicate that the effect is produced to some extent at least by an increase in the complement.

# The Medical News.

*A WEEKLY JOURNAL*

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SATURDAY, JULY 4, 1903.


## A HOPEFUL OUTLOOK.

It is with a feeling of enthusiasm that we present to our readers this week the paper by Dr. Maragliano, which has come to us fresh from the Congress at Madrid, and which gives us the result of his experiments in "The Struggle of the Body against Tuberculosis, and its Immunization."

As Jenner took the hint that led to vaccination as a means of immunization against smallpox, from a milkmaid who stoutly claimed that she could not take smallpox as she had already had cowpox, so Maragliano has developed the idea of an inoculation against tuberculosis from the well-known observation, as common and as simple as that of the milkmaid, viz., that many people, as is shown by autopsies and clinical histories, have tuberculosis, and get well of themselves, and never have a recurrence.

He holds and apparently proves that the human body contains within itself the power of exerting a potent counter-influence to the tubercle bacilli. The steps by which he proceeds in determining and intensifying this antitoxic element are ingenious, and marvelous in the exhaustive series of experiments by which he establishes a unit of test to determine exactly the effect of treatment on animals as well as on man.

When he declares that for eight years he has been able to effect a cure of tuberculous cases by means of the injection of the serum of immune animals, we are convinced of the genuineness of his clinical success. When he announces that he has at last succeeded in preparing a material which, all danger of infection being excluded, will cause, when inoculated under the skin, a tuberculous abscess, and which will render a man immune to tuberculosis, we echo his wish that there "may yet remain enough of life to him to see this conquest of science brought to an end."

Such men as Arloing, Behring, Koch, and notably Trudeau in our own country, have all contributed to the end which Prof. Maragliano believes that he has reached. If the salvation of humanity is at hand, no one is without honor, but after such earnest striving for such a glorious goal, we feel that Maragliano and his coworkers will win for themselves the satisfaction of having given hope to the race.

## THE TUBERCLE BACILLUS AND NUTRIMENT.

Nearly ten years ago Dr. E. A. de Schweinitz in the course of investigations undertaken in connection with his work as government expert at Washington, pointed out that the bodies of tubercle bacilli are rich in substances of a fatty or waxy character which can be extracted when collected in sufficient quantities by means of ether and alcohol. His work was carried on in connection with Dr. Dorset and was published in the *Journal of the American Chemical Society*, August, 1895. The conclusions reached were confirmed by Behring and others in Europe, who showed that the greater part of the bodies of tubercle bacilli, when obtained in large quantities in bouillon for the special purpose of analysis is composed of this fatty or waxy material. These investigations referred only to tubercle bacilli of human origin, but seemed to point out that only conditions in which the tubercle bacilli could obtain fatty material for its nutrition readily would make a suitable environment for the rapid growth of the bacilli.

We pointed out some years ago that these observations seemed to furnish an explanation of two facts that had been noted clinically for many years, but of which no complete explanation on clinical grounds was forthcoming. It is in persons who are under weight as is evident by clinical experience and by the attitude of insurance companies toward those who are below the normal weight and in individuals who are rapidly losing

weight that the tubercle bacillus grows with special luxuriance. On the other hand it is well known that as soon as patients begin to gain in weight the previous growth and tendency to dissemination of the tubercle bacilli in their tissues comes to a halt. In a word, there is a distinct connection between the condition of the fat contents of the patient's tissues and the tendency to tuberculosis.

When patients are losing weight, fatty material is being taken up from portions of the body where it was previously deposited and is finding its way through the lymph channels into the veins in order to be used up on the arterial side of the circulation in the presence of the oxygen from the lungs, for it is by oxidation processes that fat is burned in the body. When the fat thus being carried in the venous blood is on its way through the lungs, it evidently furnishes a plentiful supply of fatty material for the growth of the tubercle bacilli that may be present. Unless the tubercle bacillus can obtain this fatty material thus abundantly it cannot grow luxuriantly. On the other hand, when fatty material is being deposited in the body tissues, there is an absence of fat products of suitable nature for the nutrition of the tubercle bacilli in the venous blood that passes through the lungs and consequently a condition develops unfavorable to the further growth of tubercle bacilli.

Since his original observations on the composition of tubercle bacilli, Dr. de Schweinitz has made a similar set of analyses upon tubercle bacilli derived from swine, the horse, the bird, cattle and various attenuated and virulent forms of human tubercle bacilli.

While there is considerable difference in the amount of soluble matter in these various germs, there is enough of similarity to indicate that they belong to the same family. The differences that exist, however, are suggestive, inasmuch as the virulent human germ appears to be more closely related in its composition to the bacillus of bovine tuberculosis than to any other, just as the attenuated human germ appears to be more closely related to the avian bacillus of tuberculosis, which is, so it is thought, not pathogenic for man, though it can be made pathogenic by Nocard's method of growing it for a while in collodion sacs in the peritoneal cavity of certain susceptible animals.

In his article, read before the Climatological Association, last year, Dr. de Schweinitz suggests (Transactions of the American Climatological Association, Vol. 18, 1902) that the composition of these various germs is instructive in showing us that the bacilli utilized those constituents of the animal body, which are very important for life and health. He adds that it is not unreasonable to believe that this unnatural waste could be offset by food which would supply the material especially desired by the bacteria, so that the natural processes of life should be balanced and the organism able to protect itself from the attacks of disease producing bacteria. The hitherto empirical use of fats in the treatment of consumption is thus given an experimental explanation. Nuclein and lecithin, which have also been suggested on theoretical grounds apart from the composition of the tubercle bacilli, would also seem to be indicated in order to make up for the increased consumption of these substances due to the growth of the tubercle. This method of dietetic treatment would as can be seen constitute a direct antidote to the specific "consumption" of material that causes the general breakdown, and hence has caused the disease to be called, so appropriately, phthisis or consumption.

Since the tubercle bacilli are on varying culture media susceptible of great changes, not only morphologically, but in their specific virulence, which is in direct ratio with the favorableness of their surroundings, diet may actually modify the character of the tuberculosis in a given case and make it more tractable. This bacteriological substantiation of the old dietetic treatment will encourage still more the ever growing number of those who, in recent years, have been practically abandoning drugs and especially all notion of specific indication to insist upon fresh air and food as the only real remedies for tuberculosis.

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## FOURTH OF JULY TETANUS.

THE present issue of the MEDICAL NEWS bears the date July 4, and although we feel that the subject is hackneyed, yet the crop of deaths which signalizes our inevitably recurring annual epidemic of tetanus, as a consequence of the celebration of the Glorious Fourth, should not be allowed to pass without a word. Already the Board of Health of Chicago has reported a series of deaths from tetanus occurring in wounds caused by fireworks, or firearms, bought in anticipation of the noisy celebration.

We cannot hope that good sense is to prevail in this matter and so physicians must be especially mindful of every possible prophylactic precaution in the treatment of wounds that come under observation about this time and likely to be

contaminated with street dirt. As pointed out by the municipal health authorities of Chicago, a number of patients who have died have been treated by physicians from the beginning, and, sad to relate, have not all been treated by such methods as are best calculated to minimize the danger of tetanus infection.

It is now too well known by physicians to need repetition that the tetanus bacillus is absolutely anaerobic and will not grow in the presence of the free oxygen of the air.

It is almost as constantly present in street dirt, contaminated as that always is by horse droppings as it is in the dirt of farm yards, which seems to be its usual habitat outside animal bodies. Tetanus would be much more frequent, only for the fact that in open wounds the bacillus will not grow. In the seared wounds made by the burns of fireworks, toy pistols or the like, if the tetanus bacillus gains an entrance it is likely to be placed under favorable conditions for growth, because of the rapid sealing process on nature's part that follows in the attempt at repair of a burn.

The physician's duty in the matter, then, is to lay such wounds open if necessary and keep them open as far as possible rather than to encourage rapid healing. Many other therapeutic measures have been suggested but few have proved worthy of confidence. Cauterization instead of acting as a prophylactic would probably add to the danger by causing superficial coagulation necrosis of tissues beneath which the tetanus bacillus finds a favorable culture medium away from the oxygen of the air. Antitetanic serum has lost the confidence of the profession, at least when used in the later stages of the disease. After all it is not surprising that tetanus antitoxin should prove a failure, since the first manifest symptoms of tetanus are, as has been well said, not the preliminary signs of the disease, but the first warning of fatal intoxication from tetanus. The toxins of this fatal affection have already become inextricably associated with the nerve cells of the patient and there is little hope for relief.

There still remains the possibility of antitetanic serum proving useful if administered shortly after the infliction of the wound. In this case any tetanus toxin present is neutralized and a condition of the fluids of the body set up which is unsuitable for the growth of the tetanus bacillus. Prophylaxis must be a watchword and this can be best accomplished by encouraging free bleeding and preventing, as far as possible, any precocious closure of wounds that have been contaminated by street dirt. The precautions are worthy of careful attention since, according to recent statistics, tetanus has been calculated to carry off each year about 30 to 40 per million of the population of large cities.

### WHO IS RESPONSIBLE?

Governor Odell very naïvely remarks in a recent contribution to the daily press, that "in a recent visit to the institutions there was not disclosed the horrible state of affairs which has been set forth by some sensational writers in the public press," and adds, "it may be that the true situation of affairs was so concealed from him that he was unable to discern it." Perhaps the Governor inspected the Randall's Island Institution for Juvenile Delinquents in much the same manner in which he made an inspection of the State Hospital sometime in the past year—the results of which were embodied in one of his messages to the legislature.

We can well imagine the Governor did not see anything out of order at Randall's Island when his strabismic report on the conditions in the State hospitals is borne in mind, in fact, myopia seems to be the Governor's chief stock in trade in this particular phase of his duties. It is all very well to attempt to saddle the responsibility of the conditions on Randall's Island on President Orr's shoulders, but unless it can be shown that a comprehensive and thorough knowledge of the State charitable institutions is possessed by our chief magistrate, we cannot feel that the taxpayers of the State believe that the interests of its charges are being looked after, from the true philanthropist standpoint rather than from the viewpoint of political graft.

## ECHOES AND NEWS.

### NEW YORK.

**New Regulation at Post-Graduate School.**—According to the annual announcement of the Post-Graduate Medical School, 639 physicians from various parts of the United States and Canada have attended the institution during the past season. The Faculty has instituted a new system, by which certificates of proficiency will be given to such doctors as attend the clinics for six months continuously and who pass a satisfactory examination on any one subject.

**Treatment of Dysentery.**—The forthcoming bulletin of the State Health Department will make the announcement that the State antitoxin laboratory will cooperate with the Rockefeller Institute this summer in a careful investigation into the treatment of dysentery. Local health officers called upon to handle an epidemic

of the disease this year are to be asked to notify the State Health Department in order that it may be investigated. The bulletin also will deal with the use of the tetanus antitoxin, which the department is prepared to furnish to health officers.

**Epidemic of Trachoma at Buffalo.**—Advices from Buffalo, bearing date of June 24, state that trachoma is becoming more and more prevalent in that city. According to the statement of an official of the United States Marine Hospital, more than 100 cases of the disease have been found among the employes of the Lackawanna Steel and Iron Company, and many have been treated by physicians in almost every section of the city. It is believed that the disease was brought by foreigners, who came into the country by way of Canada.

**Roosevelt Hospital Busy.**—The annual report of Roosevelt Hospital, which has just been made public, shows that the number of patients under treatment in the year 1902—3,874—was greater by 104 than in the preceding year, and the daily average of patients larger by 12 than in 1901. The number of cases treated in the emergency department was 8,339, or 281 in advance of any highest previous record. The report indicates that the two automobile ambulances in use by the hospital have proved to be somewhat unsatisfactory because they have become disabled so frequently. The remodelling of the ambulances is recommended. The record in the "out-patient" department shows an increase of treatments, which is considered an encouraging sign in view of the falling off in many of the dispensaries. The gifts in money to the hospital were few, the total amounting to only $5,113.31, while the expenses for the year were $172,593.62—$13,928.32 greater than in the previous year. The report calls attention to the urgent need of increasing the endowment fund by $500,000. Not a single bed was endowed during 1902, and that the annual deficit was kept down to $6,208.23 was due to the increase in patronage of the private patients' pavilion.

**Sale of Antitoxin by Health Board.**—Dr. E. J. Lederle, President of the Board of Health, sent to the Mayor last week a letter replying to a communication from Mr. Low regarding the manufacture and sale of antitoxin by the Department of Health. In this letter Dr. Lederle says that the production by the department of diphtheria antitoxin was begun, and arrangements subsequently made, so that physicians might obtain their supplies properly, and also so that in cases where the family of a patient was too poor to pay for the antitoxin, it should be given free by the Health Department. Some time after this went into effect, Dr. Lederle writes, a provision was inserted in the charter permitting the department to sell its surplus supply. Accordingly the department sold large quantities to persons outside of the city as well as inside its boundaries. This sale was due to the confidence felt in the purity of the antitoxin produced by the New York City Health Department. According to Dr. Lederle now, however, it is the expert opinion that there are other products of antitoxin on the market which are of as high grade as that prepared by the Health Department. Believing that the sale of antitoxin by the department to persons outside the city is contrary to the spirit of the charter, the doctor says he has informed such persons they must arrange to make their purchases of other producers after July 1. He goes a step further and suggests that hereafter the department shall dispense all its laboratory products free, as do other municipal and State laboratories upon receiving the proper requisitions from department officers or private physicians. Such distribution would, of course, be confined to residents of the city who may be in need of these products as a prevention of or cure for contagious diseases. Should this plan be adopted, and should the department at the same time stop its cash sales, between $20,000 and $25,000 annually will have to be supplied by the Board of Estimate in addition to the appropriation now current, of $49,748 for the maintenance of the laboratories. Mayor Low said he would submit the suggestions of Dr. Lederle to the Board of Estimate.

**A Righteous Decision.**—The Corporation Counsel's assistant, Matthew C. Fleming, brought suit in behalf of the Tenement House Commission against Katie Moeschen, the owner of the property, No. 332 East Thirty-ninth street, for a penalty for failure to comply with section 100 of the amended tenement house law relative to sinks in yards of premises occupied by more than three families. Associated with the defendant were the United Real Estate Owners' Associations, composed of more than seven thousand property owners. They set up as a defence that the law ordering extensive improvements and exposed plumbing was unconstitutional, because it was unreasonable, arbitrary, improper and unfair, while admitting that section 100 had been violated. After a trial lasting two days, in which much testimony was taken, the case was decided in favor of the department. It was a surprise, as the defendant had demanded a jury trial, and on the jury were a prominent builder, an iron merchant, a plumber and several owners of tenement houses. But after a three hours' discussion the jury brought in a verdict against the defendant. Having obtained a verdict of a jury that in their opinion the law requiring the removal of alleged unsanitary structures from the yards of tenement property is reasonable, the Corporation Counsel and the Tenement House Commission feel that their position is morally and legally much stronger than before, and they are ready to meet the appeal taken by Philip Bloch, the Real Estate Owners' Association's counsel. Experts testified that the unsanitary condition of structures facilitated the transmission of typhoid, diphtheria, cholera and tuberculosis. Plumbers and builders testified that to make the alterations demanded under the terms of the amended law would mean an expense of $750 and upward in nearly ten thousand cases. As the law applies to all structures in this city occupied by more than three families whose cooking is done separately, this decision concerns the owners of many apartment houses where the rents run from $30 to $40 a month, quite as much as it does the owners of tenements. Probably another case will be tried very soon in the Court of Special Sessions, according to Mr. Fleming, and whichever side wins the matter will be carried to the Appellate Division of the Supreme Court in order to get a decision at the October term. This will bring the adjudication of the matter close to the municipal election, and both sides feel that political capital will be made out of the affair.

**Manhattan Dermatological Society.**—A regular monthly meeting was held June 5, 1903, Dr. L. Weiss, presiding.

The following four cases were presented by Dr. W. S. Gottheil: (1) Lupus vulgaris; present since childhood; (2) Lupus erythematosum of five years' duration. Both cases subjected to Finsen therapy three times weekly for the past 2½ months, and both showing decided improvement. Dr. Cocks stated that Finsen therapy was of undoubted benefit in lupus vulgaris; in lupus erythematosus it was not so good a therapeutic test, since equally good results might be obtained with other methods; (3) a case of eczema seborrhoicum; patches of varying size, scaly, moist and friable, covered the entire body; under treatment the condition is improving; the case was considered typical; (4) congenital tertiary syphilis in a boy of eighteen years;

eruption of tuberculous and rupial patches were present for the past four years; no history of infection obtainable; hearing and sight are good; the right tibia shows "saw bone" contour. This case was regarded as specific, but the majority of the members believed it to be acquired rather than congenital.

Dr. L. Weiss presented a woman of fifty years, showing an irregular outlined ulceration at inner angle of left eye and adjacent nose and cheek; present about two months and of rather rapid development. Many years ago patient states she had an extensive ulceration along the right postauricular and occipital regions, which healed, and now shows in this region white, glistening, pearly scar tissue. Patient denies any infection. Believing it might be an acute outbreak of lupus, patient was treated accordingly with negative results. Under ung. hydrarg. ammoniatum, the ulceration is rapidly healing and to this circumstance Dr. Weiss now suspects a syphilitic taint. Dr. Gottheil said that the old scars on neck look like old luetic lesions; the acute process was too rapid in its course and unlike lupus in this respect. Dr. Oberndorfer considers it a superficial gumma; he also looks upon the old scars as specific. Dr. Kinch said rapid growth and tendency to get well under treatment mentioned favored diagnosis of lues.

Dr. B. F. Ochs presented a case with the following history: A young man applied a bandage saturated with carbolic acid (℥i to ℥viii) to both arms to relieve an acute hyperemia and itching; some pain followed and the bandages were removed within one hour, and soothing applications applied; though the pain was relieved, some soreness still remained and within twenty-four hours a ridge of blisters was observed encircling both arms and corresponding to the upper and lower limits of the bandages; from these there developed a circle of keloid; on the left arm the circle of keloid was complete; the right arm partially so and the circle completed by a ring of pigmentation. The phenomenon was unusual and could not be satisfactorily explained by Dr. Ochs. Dr. Weiss expressed the opinion that the carbolic solution plus a tight bandage might account for the development of keloid. Dr. Gottheil remarked that so weak a solution of carbolic could not produce sufficient loss of tissue and consequent keloid. Dr. Abrahams said he saw a great deal of harm result from even weak carbolic acid solutions; if patient was susceptible, loss of tissue may have taken place; the keloid could then be accounted for.

Dr. Ochs also presented (on account of its rare situation) a case of verruca, situated on buccal mucous membranes and at angle of lips.

The following cases were presented by Dr. R. Abrahams: (1) A case which he termed morphea: a circumscribed patch of scleroderma on left cheek, showing beginning atrophy at its outer edge.

Drs. Gottheil and Pisko could not recognize any scleroderma nor atrophy; they regard it as a simple edema. Dr. Oberndorfer believed it to be edema, probably due to involvement of the nerve filaments of the infra-orbital branch. Drs. Bleiman and Sohel termed it angioneurotic edema. Dr. Abrahams said the latter would not last for eleven years, coming and going; he recognized a resemblance to a variety of morphea described by Crocker. (2) Case of idiopathic atrophy of skin confined to right foot. It began as a patch of redness which faded away, leaving a patch of pigmentation; the process repeated itself until the dorsum of foot became involved; there is some thinning of the skin and pigmentation. It was believed by the members that the process was an eczematous condition, pigmentation being secondary; the appreciable thinning of the skin was not considered a true atrophy. Some varicose veins were observed, which were regarded by Dr. Oberndorfer responsible for the extensive and unusual pigmentation.

Dr. I. P. Oberndorfer showed a case of lichen planus obtusus, lesions confined to the right lower leg. (2) A case with the following history: Male, forty years old, was operated upon nine months ago for a right sciatica, since which time the right leg is anesthetic. About four weeks ago there appeared on the right foot an eruption characterized by central excoriation peripheral vesicles and bullæ with undermining of the cutis; process extended until entire sole and inner side of foot were involved; the loose cuticle being removed reveals a highly red inflammatory zone, dry and apparently in the process of healing. Dr. Oberndorfer believes in some connection with the nerve lesion mentioned and terms the condition trophoneurotic dermatitis. The majority of the members looked upon it as a traumatic dermatitis and probably independent of the pre-existing nerve lesion.

A third case by Dr. Oberndorfer was a typical case of sclerodermia; process began three years ago in the left hand; then the right hand, face and both feet in the order named; the fingers show clubbing and the nails atrophy. The parts are hard, tense and thickened. On thyroid extract recently, and patient shows some improvement.

**The Work of the Milk Commission of the Medical Society of the County of New York.**—The warm season is at hand when food is preserved with difficulty, and when deaths from summer diarrhea in infancy become numerous. Since many of these deaths are due to unwholesome milk, which is produced in dirty dairies, is never efficiently cooled and is very old when delivered to the consumer, such milk, on account of chemical changes and its myriads of bacteria, being unfit for infant feeding, the Milk Commission of the Medical Society of the County of New York would call attention to the inspected and certified milk produced under its supervision, the general use of which should tend to diminish materially this great factor in our death rate. The inspected milk is produced at dairies which are inspected at regular intervals by the inspector of the Commission. The stables are clean and are provided with facilities for cleansing the hands of the milkmen. The water supply, the milkers, the utensils, the cattle and the transportation are all subject to requirements necessary for producing a clean and safe milk. This inspected milk may be bought in bulk for institutions or in bottles for families at or about the same price as ordinary milk. Each bottle is covered by a cap marked "Inspected by the Milk Commission of the Medical Society of the County of New York." Certified Milk is a still higher grade of milk produced under very stringent rules. Thus, among other things, it is required that the dairies producing this milk should sterilize all bottles and other utensils and seal and date every bottle of certified milk. Certified milk is sold at a somewhat higher price than inspected milk.

Inspected milk is supplied by L. L. Campbell & Brother, 2288 Broadway; Locust Farms Company, 812 Sixth avenue; Meadow Brook Dairy Co., 984 Fulton street, Brooklyn.

Certified milk is supplied by Briarcliff Farms, 573 Madison avenue; Brookside Dairy Farm, Newburg, N. Y.; Hyde Park Milk Co., 587 Madison avenue; Locust Farms Milk Co., 812 Sixth avenue; Meadow Brook Dairy Co., 984 Fulton street, Brooklyn; Sheffield Farms (Slawson, Decker & Co.), Offices of Sheffield Farms; Slawson Brothers and T. W. Decker & Sons; Sugar Loaf Dairy Co., 530 West Twenty-second street; Thorndale Farms Co., 901 Sixth avenue.

## PHILADELPHIA.

**The Phipps Institute and Its Progress.**—The Phipps Institute was established by Mr. Phipps for the Study, Treatment and Prevention of Tuberculosis. Temporary quarters have been taken in a large building well adapted to hospital purposes and near the overcrowded tenement district. The dispensary was opened on Feb. 1, 1903. Within the past month three wards (two for men and one for women) of 16 beds each have been opened for the care of cases in the last stages of the disease. There is no restriction to admission with the exception of a certificate, signed by a member of the applicant's family permitting an autopsy in case of death. As the Institute has for one of its principal objects the *study* of tuberculosis, this is a matter of importance. In but very few instances has this permission been refused.

An emergency ward of four beds has also been provided for those of the dispensary cases suffering from hemorrhages or pleural effusions needing immediate attention. In addition to the three large wards there are ample facilities for the dispensaries, laboratory and post-mortem room.

To date there have been treated in the dispensary 1,167 cases; of this number at least 200 are non-tuberculous. Many of them coming to the institution for an opinion. It is surprising the widespread interest that is being displayed as to the danger of the disease. A complete history and physical examination is made of each case and exact instructions given as to how they shall take care of themselves and avoid transmitting the disease to others. Each case is provided with a paper spit-box, paper napkins and a paper bag for disposing of the soiled napkins. The bag and its contents are destroyed by fire each day. The advantages of sleeping in a well-aired room, keeping in the open air during the day and avoiding exercise are also explained.

The city has been divided into districts for the distribution of milk, which is given free to those unable to pay. This practically includes every one with the exception of those living in parts of the city inaccessible to the milk man. It might be added that no case in a position to pay a reasonable fee to a physician is treated. Information on this point is obtained from the applicant: (1) wages, if working; (2) sick benefits, and (3) expenses for living. It is a simple solution of the dispensary abuses and thus far seems most successful.

Following the scheme devised by Calmette, of Lille, a large map of the city has been provided and by means of pins with colored heads the situation of each case of tuberculosis is indicated. The different colors indicate the amount of milk (1, 2, 3, or 4 quarts) received; also whether the milk has been stopped or the case receives no aid. One of the great difficulties has been to keep a proper watch over the cases and see whether the instructions were carried out. This has been overcome by the appointment of inspectors whose duty it is to visit the houses from time to time and see that the applicants live up to the rules. It is the intention to appoint as inspectors cured or arrested cases from the Whitehaven Sanatorium. This will provide them with employment and having been thoroughly schooled in the treatment, make them competent judges. Of course it is entirely too early to form any conclusions but it can be definitely stated that a large proportion of the cases have shown a slight but consistent gain in weight. The milk which is the best quality obtainable may have some bearing on the question of weight.

**State Board of Medical Examiners.**—The midsummer meeting of the Pennsylvania State Board of Medical Examiners was held during the week beginning June 23. In Philadelphia, 246 candidates were examined and 145 in Pittsburg. President Beates stated that the standard had been considerably raised from that of previous years.

**Improvement Needed at Municipal Hospital.**—As a result of an inspection of the Municipal Hospital, Director Martin has stated that the conditions there are not what persons who are forced to go to the institution should rightly expect. It is stated that more rigid attention should be given to the disinfection of nurses and attendants who are constantly leaving and entering the hospital. The arrangements for the disposal of infected material and refuse are inadequate. A crematory should be erected on the ground in order that this material can be destroyed instead of entering into the sewers. The place is infested with rats, which may be a medium of spreading the diseases under treatment at the hospital.

**Additional Filter Placed in Operation.**—The Upper Roxborough filter plant was placed in operation June 26. With the aid of the Lower Roxborough plant, which was completed several months ago, that portion of the city included in Germantown, Chestnut Hill, Mount Airy, Roxborough, Manayunk and the section lying north of Allegheny avenue, between Broad and Sixth street, will now be supplied with filtered water. The lower plant is now filtering 8,000,000 gallons of water a day. The Upper plant will filter 18,000,000 a day, though at present it is limited to 8,000,000, in order to allow the beds to ripen. The wards now supplied are the Twenty-first, Twenty-second, Thirty-third, and Thirty-seventh. The three latter are at present the center of contagious diseases in the city, and the use of filtered water is expected to bring about a decided change in these conditions.

**Pasteurized Milk Plant to be Installed.**—Nathan Straus, of New York City, has given to Philadelphia a complete Pasteurizing plant, to provide modified milk for the children of the poor of this city. The work is to be carried on by contributions of the people. The old police station at Fifteenth and Filbert streets is being prepared as a site for the plant. The Children's Aid Society has offered a suitable room in its building as a distributing center. The formulæ of milk preparations will be under the supervision of the Philadelphia Pediatric Society.

**Herb Doctor Convicted.**—George P. Hossey, the negro herb doctor who has been on trial for a week, charged with complicity in the murder of William G. Danze, was convicted June 26 of murder in the first degree. The jury was out a little over an hour. Danze died two years ago and the attending physician made out a certificate giving heart disease as the cause of death. The police became suspicious and after a careful investigation Danze's widow and Hossey were arrested. Danze's body was exhumed and arsenic was found in the stomach. It was later discovered that Hossey sold the arsenic to Mrs. Danze, with which, it is alleged, she ended her husband's life. She will be tried in the fall. It is charged that Hossey has been implicated in at least twenty murders.

## CHICAGO.

**Urges Emergency Hospitals.**—County Commissioner Wm. H. Thompson has advocated the erection of three emergency hospitals in the poor districts as adjuncts to the County Hospital, that accidents and emergency cases may receive quicker service. At a meeting of the building committee, he said that many lives might be saved if the patient received care more promptly. Other members of the committee favored such hospitals, if the County Board can get the money with which to build them.

**Plan for a Home for Consumptives.**—Plans were discussed by the county commissioners for the removal

of the consumptives from the county institutions at Dunning, and the building of a new hospital for their care under the most modern methods, at some spot among the highlands in a more remote portion of Cook County. The Commissioners propose to get the $100,000 or more, which the new colony for consumptives would cost, from the proceeds of the $1,250,000 bond issue which was voted by the county at the recent judiciary election.

**Death of Dr. N. H. Henderson.**—Blood poisoning, resulting from an operation for the relief of a dying patient, brought to an end the career of Dr. Nelson H. Henderson, executive head of Lakeside Hospital, of this city. An unnoticeable defect in the rubber gloves used during an operation, and a slight abrasion of the finger, due to a small hangnail, were the contributing causes.

**Preliminary Report of the Milk Committee of the Chicago Medical Society.**—At the last meeting of the Council of the Chicago Medical Society, a committee was appointed to consider the milk supply of the city of Chicago, and was empowered to take such steps as they might consider advisable, with a view of improving the quality of the milk brought into Chicago. It was suggested that the committee act for the Chicago Medical Society in disseminating such information among the profession and the public that might bring about a demand for high grade milk. There are about 628,000 quarts, or 19,600 cans of 8 gallons each of milk supplied to Chicago daily, a per capita quantity of approximately two-thirds pint. To produce this amount of milk, some 50,000 cows are required, on some 5,000 to 6,000 dairy farms. These farms are located in Illinois, Wisconsin, or Michigan, within a radius of 150 miles. Milk as presented to the consumer may be classified, depending on its manner of production, method of handling and quality, as: (*a*) Bulk milk and cream complying with the city ordinance as to quality, equaling three per cent. fat and twelve per cent. total solids for milk, with twelve per cent. fat for cream; (*b*) skimmed milk, marked by a tag bearing the words "skimmed milk," that is attached to the shipping cans and the pouring cans; (*c*) bulk milk that has been bottled in the city; (*d*) bottled milk, the bottling having been done at the stations in the country; (*e*) high-grade milk ("certified"), produced under the most approved dairy methods. Bulk milk and city bottled milk comes from the country on the regular milk trains. It is usually mixed night and morning milk, and leaves the dairy between four and seven o'clock in the morning, and arrives at the various railway milk platforms between 9.30 and 10.30 A.M. The cans are then taken to the city dealer's depot and kept cool until the following morning. Some of it, meantime, is placed in bottles, and is delivered to the consumer twenty-four to thirty-six hours from the time of milking. The milk bottled in the country is about the same age when delivered, but it remains on ice in the country during the day, and is brought into the city during the night. Practically all the bottles are packed in cases that are iced, and they remain iced from the time they are bottled until they reach the consumer. At the present time the chemical quality of the city's milk supply is under control of the Department of Health. By persistent vigilance, a good quality, from the chemical standpoint, is easily maintained. Only one sample is now found below grade to the 10 to 15 found below grade at the beginning of this inspection, ten years ago. Bulk milk will vary most in quality because of irregular mixing. Bottled milk is quite uniform, because a large volume is mixed and filled quickly into bottles. Few persons know of the skimmed milk tag, and many, therefore, get low-grade milk, while the dealer is protected against prosecution. Every housewife has the right to see if there is a tag on the can or not. Today, coloring matters or preservatives rarely are found in the milk. What is especially lacking is sanitary control of the dairy, and this is very difficult, if not impossible, in certain directions. We can only force the farmer to change his uncleanly methods by a slow, laborious education of the public to purchase only such milk as has been obtained under the most approved sanitary methods. The bacteriology of milk is the index of its sanitary condition. The bacteria commonly present are derived in small number from the cow, and in great numbers from extraneous sources. Bulk milk and milk bottled in the city contain the largest number of bacteria, while "certified" milk contains the least number. The number of bacteria in milk can be kept to the minimum by clean milking, quickly cooling, and maintaining a low temperature until consumed. The dairy men are directly responsible for dirty milk. The conditions under which milk is placed in the first few hours after it is drawn determine whether it will be pure or not. During the summer months it is most difficult to maintain the necessary low temperature. The average farmer has no ice, and the ordinary milk train is not a refrigerator car. Bulk milk is presented to the consumer usually just before it sours. Such milk, when bottled in the city, gives a false security, as the consumer believes it has been bottled in the country. Milk produced under fair conditions, bottled and iced in the country, and transported in refrigerator cars, as most bottled in the country milk is, makes a good supply for general use. It is preserved from dirt, it is manipulated less, and cooled at a time when the cooling has the greatest value.

For infant feeding and for the sick, the highest quality of milk should be obtained. Certified milk is produced in a small way only because the demand for it is not large, and did the profession take the interest in the subject that they should, there would be such an increased demand for pure milk that would encourage its more general production. In the feeding of babies, no compromise in the quality of milk can be tolerated. It must be the best milk that we give to the babies, if we would reduce the enormous infant morbidity and mortality that prevail in urban centers.

**Instructions for the Home Care of Milk.**—No milk should be accepted unless bottled and sealed, and delivered from wagons with coolers. The bottle should be taken from the hand of the deliverer (not be left to stand in doorways and halls) and placed immediately upon ice. In the absence of ice, the cold bottle should be wrapped loosely in paper, old newspapers, and kept in the coolest corner. Never put the cold bottle under the faucet, as ample paper wrapping will, if dry, keep out the heat for many hours. Never remove more milk or cream from the bottle than is needed for immediate use, replacing the cover at once. The cover should be handled with a clean fork. If cream is needed, remove carefully by pouring from the top layer. If whole milk, shake the bottle before unsealing. If properly stoppered, it can be inverted repeatedly till thoroughly mixed. When small quantities of milk or cream are needed at short intervals, it is better to order two or more small bottles than one large one, allowing the reserve supply to stand wrapped, sealed and undisturbed. It should be borne in mind that every contact of the milk with cups, spoons, feeders, or even the air, increases the danger of contamination by germs, from which no household is free. Keeping the milk cold is the best means of retarding chemic and putrefactive changes from germs already in the milk. Never pour milk back into the bottle. Flies are the most industrious infection carriers, so that the exposed rim of

the bottle, the stopper and all cups and spoons must be carefully protected from these pests. Visible dirt rarely poisons. It is the unseen germs of disease that may be destroyed only by the free use of soap and frequent boiling of all kitchen and table utensils. Under some conditions milk may be scalded (Pasteurized), or boiled (sterilized), to destroy the germs it contains, and this may be advisable when the milk supply is not above suspicion, but it should be remembered that boiling impairs the food value and also renders the milk less digestible. It does not rejuvenate old milk, but merely makes it "keep" better by destroying ferments which cause putrefactive changes. The committee would suggest that every member of the Chicago Medical Society investigate the milk supply of his patients. No bulk milk or milk bottled in the city should be used under any circumstances. Milk bottled in the country, cooled and kept on ice, can be obtained from a number of milk dealers, and should be the only milk used for general consumption. Certified milk only should be used in the artificial feeding of infants. The committee would also suggest that a permanent milk commission should be organized by the Society to undertake a pure milk crusade, and certify to the grading of all milks delivered in Chicago.

**Endow Medical Paper.**—The *Journal of Infectious Diseases*, a new magazine to be established at the University of Chicago, has been endowed by Mr. and Mrs. Arnold F. McCormick, the parents of "Little Jack," John D. Rockefeller's favorite grandson, whose death from scarlet fever three years ago inspired the establishment of the Rockefeller Institute for Medical Research. It is believed that the eventual endowment fund will be about $125,000. Dr. Ludvig Hektoen, head of the department of pathology and bacteriology at the university, and Dr. Edwin O. Jordan, associate professor of bacteriology, are to be the editors. The first number will appear from the University of Chicago press on January 1.

## CANADA.

**Ontario Medical Association.**—The twenty-third annual meeting of the Ontario Medical Association was held in Toronto on June 16 to 18, under the Presidency of Dr. J. C. Mitchell of that city; Dr. Harold C. Parsons of the same city performing the duties of secretary. It was a three days' meeting, the first time that the Association had ever held a meeting longer than two days, and the success which attended the venture was more than satisfactory to the officers in charge. Dr. J. H. Musser, of Philadelphia, was present and delivered a highly interesting address on the treatment of pneumonia. Dr. Thomas S. Cullen, of Baltimore, contributed a very able paper on the uterine myomata and their treatment. On the morning of the third day there was held a discussion on arteriosclerosis, which was opened by Dr. H. B. Anderson, of Toronto, with a paper on the etiology and pathology of this condition. This was followed by a paper on the cardiac aspect, by Dr. J. W. G. McKay, Oshawa, Ont.; Dr. John Caven, Toronto, dealt with the renal aspect and Dr. Hugh McCallum, London, Ont., with the cerebral aspect. Dr. J. C. Connell, Kingston, contributed to the ophthalmic lesions, while Dr. John L. Davison, Toronto, contributed a paper on therapeutics. The following officers were elected: President, Dr. J. F. W. Ross, Toronto; Secretary, Dr. Charles P. Lusk, Toronto; Treasurer, Dr. Andrew R. Gordon, Toronto.

**Amalgamation of Trinity and Toronto.**—Matters have progressed to a very favorable degree as regards the amalgamation of these two medical schools. A joint agreement has been reached by the faculties of the two universities, which, it is understood, has been signed by the representatives of both faculties, agreeing to amalgamate, and it now remains for Trinity University at an early meeting of that corporation to consider the terms of federation of the two universities and thus wind up the proceedings for one large medical faculty in connection with the provincial university, the University of Toronto. As Toronto Medical Faculty has a student body of 400 and Trinity Medical College one of about 250, the combined forces will make a very large medical school for this city.

**Chief Coroner for Toronto.**—The Ontario Government, during the session of the Legislature just closed, has created in Toronto the position of Chief Coroner and has appointed to the position Dr. Arthur Jukes Johnson, the well-known medicolegal expert. Now, when any medicolegal case is referred to any of the associate coroners, he will immediately report to Dr. Johnson, who shall determine whether or not any inquiry shall be made and will direct what coroner shall have charge of same. This will do away with the wire-pulling which has been indulged in in the past in connection with coroner's inquests in Toronto. The office carries with it an honorarium of $1,500.

## GENERAL.

**Appointment of Dr. Horsley.**—Dr. J. Shelton Horsley, of El Paso, Texas, has accepted the Chair of Principles of Surgery at the Medical College of Virginia, Richmond, Virginia. He has also been elected to one of the positions of attending surgeon to the Memorial Hospital.

**Honor Men at Yale Medical School.**—The anniversary exercises of Yale Medical School were held in the College Street Hall on June 23. The address was by Prof. Henry Mills Hurd, Superintendent of the Johns Hopkins Hospital, Baltimore, on "The Duty and Responsibility of the University in Medical Education." Honors to members of the Medical School graduating class were announced as follows: Degree of Doctor of Medicine, Cum Laude: Charles E. Farr, Athol, Mass.; Albert H. Garvin, Wethersfield, Conn.; Herbert C. Gibner, Bridgeport, Conn., and John E. Lane, Hadley, Mass.

The Campbell Gold Medal for highest rank in the examinations of the course was awarded to Herbert C. Gibner, Bridgeport. The Keese Prize for the most meritorious theses was won by John H. Bailey, of New Haven.

**Yellow Fever in Mexican Ports.**—The sanitary authorities are taking stringent measures to stamp out yellow fever, which exists in nearly all the Gulf ports. Progreso and Merida are the worst affected, but Tampico has an epidemic which is causing anxiety there. Several unsanitary houses have been burned. The bodies of three victims, who tried to escape being sent to the Lazaretto, were found on the outskirts of Tampico yesterday.

**Obituary.**—Dr. F. J. E. Rohmer, one of the best known retired physicians of the South, died at Mobile last Tuesday, aged ninety-one years. He was born in Alsace and was one of the founders of the Charity Hospital in New Orleans.

# CORRESPONDENCE.

## TRANSACTIONS OF FOREIGN SOCIETIES.

### British.

CLINICAL AND EXPERIMENTAL OBSERVATIONS UPON GENERAL PARALYSIS—TWO MYOMATA UTERI WEIGHING NINE POUNDS—OVARIAN PAPILLOMATA.

Dr. Lewis C. Bruce, at a meeting of the Ophthalmological Society, held May 8, 1903, read a paper entitled "Clinical and Experimental Observations upon General

Paralysis." He said that in his previous communication to the Society, his conclusions were (1) that general paralysis was a disease directly due to poisoning by the toxins of bacteria, the point of attack of which was through the gastric and intestinal mucous membrane; (2) that the poisoning was probably a mixed one, but the *Bacillus coli communis* was apparently one of the noxious organisms; and (3) that the result of treatment by means of serum taken from cases of general paralysis in a condition of remission and injected subcutaneously into early progressive cases pointed to the fact that some form of serum treatment was the proper treatment for this as yet incurable disease. Further observations had led him to modify the second conclusion, that the *Bacillus coli communis* was a cause of the disease. He now believed that the *Bacillus coli* infection was a secondary one. In the Perth District Asylum recent acute cases of general paralysis were rarely admitted, and so the material for observation was therefore limited. Since the commencement of these observations, Dr. Bruce has treated in all eight general paralytics with serum derived from general paralysis in a state of remission. Three of these patients had made apparently complete recoveries. The patient in Case I had been discharged for three years and earned his livelihood as a saddler; the patient in Case II had been discharged for eighteen months and was working in the Post Office; and the patient in Case III had been discharged for nine months and worked as a dyer. Of the remaining five patients, one was relieved and had shown no progressive symptoms for four years. The remaining four were not improved. The leucocytes were regularly examined in two of the patients who recovered and in all the patients who did not improve. The only change noted was a continuous hyperleucocytosis during the period when the serum was being administered subcutaneously in 2 cm. doses daily. In the patients who recovered the leucocytosis fell to below 10,000 per cubic millimeter of blood and the percentage of polymorphonuclear cells was generally below 50. As according to his previous observations the blood of 70 per cent. of general paralytic patients contained an antibody which agglutinated the *Bacillus coli communis* in low dilutions of 1 in 10, he treated two cases with antibacillus coli serum. Neither patient benefited by the treatment. The leucocytosis induced by the subcutaneous injection of antibacillus coli serum was often very high, running to 40,000 per cubic millimeter of blood. Dr. Bruce next investigated the leucocyte changes which occurred in the various stages of the disease. In his first series of observations, he had already recorded that in patients suffering from general paralysis there was a recurrent hyperleucocytosis. In a second series of observations made in six cases the fact of a recurrent leucocytosis was confirmed. Stained films showed that in the first stage of the disease the polymorphonuclear leucocytes were generally present in a percentage of 70 or 80. As the disease advanced these cells diminished in number until in the third stage of the disease they might fall as low as 40 per cent. As the polymorphonuclear cells decreased the leucocytes increased. As eosinophilia was invariably present at some time during the course of the disease and varied from 15 to 5 per cent. of the total number of leucocytes. This eosinophilia was a sign that the disease was active; it was not present in patients who had passed into a definite remission or who had recovered. It was a fact that the course of general paralysis was often temporarily arrested if the patient suffered from some intercurrent inflammatory condition such as erysipelas. To ascertain if this arrest of the disease were due to the leucocytosis induced by the inflammation or to the specific antibodies formed in the blood and tissues, Dr. Bruce made the following observations. Three cases of general paralysis, all with acute symptoms, were treated with small doses of *Streptococcus pyogenes* toxin. The organism was grown on nutrient broth for a week at a temperature of 37° C. The culture was then killed by heat. This was then tested on rabbits to ascertain its virulence. Each patient then received half cubic centimetre doses of the fluid subcutaneously. Case I, a male, showed no reaction in temperature, pulse or leucocytosis and there was no mental benefit. Cases II and III both gave a mild febrile reaction (99° and 99.8° F., respectively). The pulse in both rose to 100; slight leucocytosis was present (14,000 and 15,000 per cubic millimeter). The polymorphonuclear cells rose above 80 per cent. and the eosinophiles fell to one and two per cent. The most marked result, however, was the mental effect. Both patients became quiet and sensible recognized that they were ill, and submitted to treatment. The effect of the first injection passed off in a week, when it was noted that the percentage of eosinophiles was again increasing in the blood. A second and third injection gave exactly the same results and then the patients evidently became immune, as further treatment yielded no results. After a due interval the toxins of the staphylococcus aureus prepared in the same way were injected, but the subsequent reaction was feeble and gave no definite results. The fact that in Case I, where there was no hyperleucocytosis there was no beneficial action, and that in Cases II and III with a hyperleucocytosis with high polymorphonuclear percentage, there was distinct benefit, would seem to indicate that the increased polymorphonuclear leucocytosis was the active agent in assisting recovery. The fact of the rapid reaction to the toxins injected and the immunity quickly produced, as well as the failure in reaction of the *Staphylococccus aureus* would point to the fact that the toxins of the streptococcus had produced some antibody in the blood and tissues which temporarily raised the resisting power of the patients. To ascertain if the increased leucocytosis alone were capable of arresting the disease, Dr. Bruce took Case I of the previous series, in which the patient had not benefited by serum treatment and observed the leucocytosis, temperature and pulse for several days. Two cubic centimeters of terebene were then introduced subcutaneously but with hardly any reaction and without benefit to her mental or physical condition. In the case of a male patient the reaction was marked; the leucocytes went up to 29,000 per cubic millimeter of blood; the polymorphonuclear cells were 80 per cent. There was great physical and mental benefit. In two months he was discharged to his friends. Two cases were treated with antistreptococcic injections of 2 cm. daily for over a month, and both benefited temporarily but relapsed on discontinuance of the treatment. Dr. Bruce thought that the benefit was largely due to the leucocytosis induced. The results of these observations were, he thought, evidence against the theory that general paralysis was a disease due primarily to the breaking down of the brain neurons as the result of syphilitic poisoning, and they supported the more recent view that the disease was due to the direct action of bacterial toxin which, when temporarily overpowered, allow nature to put into force the constant attempts at recovery which were so marked a feature of the disease. Syphilis, plumbism or great mental and physical strain were undoubtedly the predisposing factors, but without the direct bacterial attack there would be no such disease as general paralysis.

Dr. SMYLY, at the Royal Academy of Medicine in Ireland, Section of Obstetrics, April 24, 1903, showed the following specimens: (1) Two myomatous uteri weighing 9 pounds. Ovarian Papillomata. The patient was first seen on Oct. 18, 1902. The tumors, which were confounded with the uterus, on bimanual examination, were

supposed to be myomata. When seen on April 28 the abdomen was very much distended with ascitic fluid and the patient was suffering intense pain. Abdominal celiotomy was performed Oct. 31. The abdominal peritoneum was studded with secondary growths and the omentum was a mass of disease. The two cystic ovaries, which were universally adherent were removed with much difficulty, and also the omentum. The patient recovered. (2) The patient from whom the specimen was removed was first seen in February, 1901. Though she had long passed the menopause a sanguineous discharge from the uterus had been going on more or less for two months. Curetting was advised, but was declined, and she was not seen again until six weeks previously, when a fungous growth was observed to be protruding from the os uteri. Vaginal hysterectomy was performed. The operation was a difficult one owing to the friability of the uterus, but it was successfully carried out and the patient made a good recovery. It was remarkable that an operation was still possible two years after the probable commencement of the disease. (3) This patient suffered intense distress from pelvic pressure, and, the uterus being found enlarged and retroverted, the symptoms were attributed to the displacement. Abdominal suspension of the uterus by Kelly's method was performed, but owing to the obstruction of the bowel, the abdomen had to be reopened, and the cause of the obstruction was found to be an adhesion of the rectum to the cervix, which it had been found impossible to separate at the original operation; the uterus was therefore allowed to return to its former position and the abdomen was closed. Her sufferings were so great that she was obliged to relinquish her employment, and when the removal of the uterus was suggested she readily consented to have the operation performed. About a fortnight subsequently Dr. Smyly performed a supravaginal amputation and the patient made a good convalescence.

## SOCIETY PROCEEDINGS.

### NEW YORK ACADEMY OF MEDICINE.

Section on Orthopedic Surgery.

*Meeting of April 17, 1903.*

T. Halsted Myers, M.D., in the Chair.

**Septic Joint Disturbance?**—Dr. Ely presented a young man with peculiar hip symptoms for diagnosis. E. P., eighteen years of age, jeweler. No history of tuberculous or of venereal diseases. About three years ago had malarial fever, which lasted one week and disappeared upon the exhibition of quinine. No history of infantile disease or of pneumonia. Two years ago, while in swimming, felt sudden pain in right knee. About two weeks afterward began to walk lame, and has been lame ever since. Pain grows better and worse, being especially severe after a hard day's work. Does not bother him at night. Eats well and sleeps well. Has also had pain in left shoulder for eighteen months. Only one centimeter atrophy of thigh. The limb is in flexion of 150 degrees, and in abduction and external rotation. Limitation of motion in all directions, and marked muscular spasm. Actual shortening of three centimeters, and apparent lengthening of 2½ inches. The left arm is slightly atrophied, and motion in left shoulder joint is restricted. The X-ray of hip shows nothing.

Dr. Dowd said he thought the case suggested septic joint disturbance, if there are septic conditions of a very mild grade, which affect the joints, causing anchylosis.

Dr. Townsend said that at the Johns Hopkins Hospital, a new method of employing tuberculin was used for ascertaining positively whether a condition was due to tuberculosis or not. The results had proved successful in over 90 per cent. of the cases. He considered this case one of rheumatoid arthritis.

Dr. Northrup said that he made 65 injections at the Presbyterian Hospital in connection with pulmonary lesions. With adults the results were good, and they were published. In the children's wards, he got no reliable results at all. Could not tell whether the reactions were caused by constipation or tuberculosis.

Dr. Myers said that in St. Luke's Hospital he had used tuberculin for diagnosis in children, and had obtained typical reactions where tuberculosis existed. He had found no reaction in rheumatic cases, or in one case of hysterical joint, but had several times obtained the reaction in cases which seemed to be specific. Possibly these were cases of mixed infection. Dr. Myers considered Dr. Ely's case rheumatic rather than tuberculous, neither the glands nor spleen were enlarged.

Dr. Ely said, in closing the discussion, that the case had been a puzzle to him. The patient had been in plaster. He said it was a question now what to do with him.

Dr. Dowd presented the following cases:

**Deformity of the Finger.**—*Case I.*—Deformity of finger following injury received when a small child, resulting in cicatrice which bound the finger down. Skin grafting, as advocated by Wolf in 1875 was employed, and lengthening of tendon as advocated by Dr. Hibbs. The graft was taken from the girl's thigh, the entire thickness of the skin. The finger is nearly straight, which illustrated the fact that a joint can be held an indefinite length of time in a flexed position without becoming anchylosed in that position.

**Paralysis of the Tibialis.**—*Case II.*—Paralysis of the tibialis anticus muscle. Patient came to hospital eighteen months ago. At that time had marked valgus. The tendon of the tibialis anticus was split; part of it was left attached to its own muscle, the other part was brought across and fastened to the extensor tendons. A brace was worn for a time. Patient has now a good gait, and walks almost squarely.

**Tendon Transplantation.**—Dr. Dowd presented another case of tendon transplantation. Patient had a varus due to paralysis of the peroneal muscles. The tibialis anticus was split; the lower end was brought around and attached to the peroneus longus. When the patient raises his foot the new tendon may be seen. The varus is pretty thoroughly corrected.

Dr. Townsend said he had been impressed by the fact that good results were not always noticeable, in these cases of tendon transplantation, at first, but were observed later on which good results were largely due to subsequent treatment. He thought this quite as important as the operation. Patients could not be operated on and turned loose, as the tibialis anticus could not be expected to support the foot entirely.

**Syphilitic Osteitis.**—Dr. Townsend presented a case of syphilitic osteitis of spine and hip. This girl was born in Ireland. Had ulcer on the leg when about six years of age, which was healed by means of some form of ointment used. After that disappeared, the deformity of the spine, which he exhibited, appeared. Two years ago, when she came to the hospital, she had two ulcers on the left leg. They were of the type described as characteristic of syphilis—round, punched out, hard, large, and discharging offensive pus. Family history entirely negative, nothing to indicate disease in father, mother or other children. He did not give much thought to ulcers on account of condition of left hip. The hip presented symptoms of hip-joint disease,

flexion, abduction, tenderness, sensitiveness, very little motion. She was put on iodide of potassium and mercury later, and ulcers healed. Brace was applied, and gait now shows one hip is as good as the other.

He thought that few cases of hip-joint disease could be ascribed to syphilis, but in his case the symptoms which were apparently due to that disease, cleared up on administration of remedies usually given for it. He thought the condition might be due to a neurosis.

Dr. H. L. Taylor said that he had observed that when cases cleared up on mercury, the conditions might usually be ascribed to syphilis. He thought that even if syphilis were present, however, there might be other lesions, not of such a nature. He had watched Dr. Townsend's case, however, and thought that the hip, skin lesions and spine were of syphilitic origin.

Dr. Nathan said that he had known syphilitic joint lesions to get well without treatment, and he had been treating a case of double tuberculous hip disease, in which the child walked about in three weeks after using the iodides.

**Typhoid Spine.**—Dr. Hibbs presented a case of typhoid spine. Boy, age eighteen years. On August 12 developed typhoid fever. Got up from bed September 23, and felt well until November 4. Then in the right lumbar region had a feeling of soreness. The pain increased in severity, extended to left lumbar region and also over the spinous processes. He remained in bed seven weeks. The pain extended to both legs, but was not so severe as in the back. On the night of November 4 he had a chill, followed by fever and delirium. There was no delirium the next morning, and he did not notice any fever. December 12 he got up from bed with some pain; he could not stand alone, and had lost considerable weight and he noticed that the spine was curved, the convexity being to the right, extending from ninth dorsal to last lumbar vertebra. There was marked rigidity, sharp spasm and pain upon pressure. Brace applied on December 24. He visited the hospital January 9; the lateral curve was not so pronounced; there was less pain, which was limited to the left side and he walked more erect. On January 23, when next seen, there was less lateral deviation of spine, though there was still pain on left side. February 6 the spine was straight, and general condition much improved. At no time was there any interference with control of bladder or rectum. Though at his first visit to the hospital the deep reflexes of the knee were exaggerated, now they are normal.

**Diabetes Insipidus, Arthritis of Knee.**—Dr. Hibbs presented a second case for diagnosis.—Girl, age 8 years. Admitted to hospital March 10, 1903. No family history of tuberculosis or syphilis. The child has had measles, otherwise has always been healthy. The patient suffered two years ago from some vague gastric disturbance after which the left knee became swollen, accompanied by loss of function and by pain in the knee. The swelling persisted and other joints became enlarged and temporarily painful and sensitive. The mother is not able to give any more details of the history. The child was found to be fairly well developed and apparently anemic. Central incisors notched slightly but corresponding in no way to the Hutchinson type. Chest, negative, except for a soft systolic murmur heard best in the third interspace on the left side and apparently hemic in character. Abdomen, superficial veins rather well outlined. Patient is capable of distending the anterior abdominal walls to a remarkable extent, so that the more movable viscera are apparently displaced downward, the liver and spleen becoming easily palpable. She is likewise capable of throwing the belly walls into the scaphoid position. If allowed to do so, she will permit urine to collect in the bladder in such amount as to distend this viscus above the umbilicus, after which she will pass about 26 to 30 ounces of urine. She is thirsty and will drink inordinately if permitted to do so, even resorting to the water in which she is bathed. Her appetite is not particularly good. The blood examination reveals a secondary anemia of the chlorotic type. Temperature, pulse and respiration entirely normal. Urine, daily amount, between 95 and 100 ounces; very pale; faintly acid; sp. gr. 1.001; faint trace of albumin; no sugar; numerous pus cells; large numbers of desquamated epithelium—round and squamous; no casts; few urates. There was found to be thickening of the synovial membrane and effusion in left knee-joint, also involvement of the joint of one finger, and phalanx of another. The arc of motion was not limited.

**Hypertrophy of Fringes of Synovial Membrane.**—Another case presented by Dr. Hibbs. Girl, age eleven years. Past and family history unknown. Patient comes to hospital (March 6, 1903) stating that, for six months past, she has been suffering pain in both knees, affecting more particularly the left, and coming on after exertion. She states that she is able to walk 15 or 20 blocks without inconvenience, but that any greater walk results in severe pain in the knees. She has noted that, while skating, her leg has become suddenly stiff as if held by a cord. During this period the leg is slightly flexed on the thigh. After a few moments' rest the limb resumes its former posture. There is no limitation of motion in either joint. On examining the joint, one can feel something like rice bodies, which are painful on pressure. An apparatus has been applied, limiting motion in extremes of both flexion and extension, with lateral support.

**Internal Derangement of the Knee-Joints.**—Also introduced by Dr. Hibbs. Came to Orthopedic Dispensary four days ago. His mother said that for the past three weeks the child had been limping occasionally, and complaining of pain in the knees. Found in each knee a small piece of movable cartilage, which is assumed to be the cause of the difficulty. A loose cartilage was also found over the tip of the external malleolus of ankle, and over the tip of the elbow. They are new growths, or have been chipped off.

**Extreme Rachitic Deformities.**—Dr. Myers presented this case. Colored child now four years old. Has never walked erect. Lies in bed always. Progression is peculiarly apelike; child squats on its haunches and then advances on all fours, the thumbs being turned backward. Feet are in marked valgus; anterior curvatures of tibiæ and femora; coxa vara; prominent abdomen; thorax narrow and horizontal in curvature of ribs, which interferes with action of heart and lungs, rachitic rosary, curvatures of clavicle, cubitus varus, enlarged radial and tibial epiphyses, craneotabes. Previous history unknown. The case was presented especially on account of the extreme muscular weakness, persisting so long, and after most of the sensitiveness has disappeared.

DISCUSSION OF DR. HIBBS' CASES.

**Diabetes Insipidus.**—*Case II.*—Dr. Northrup said that in regard to the fusiform formation of the shaft of the bones of the fingers, it was almost impossible to tell, by looking at the fingers, whether the cause was osteoperiostitis due to syphilitic or tuberculous processes. Almost all fusiform shafts turned out, on autopsy, to be tuberculous; simply from morphology it would be impossible to determine. He thought retroperitoneal, tuberculous nodes, could account for the abdominal appearances.

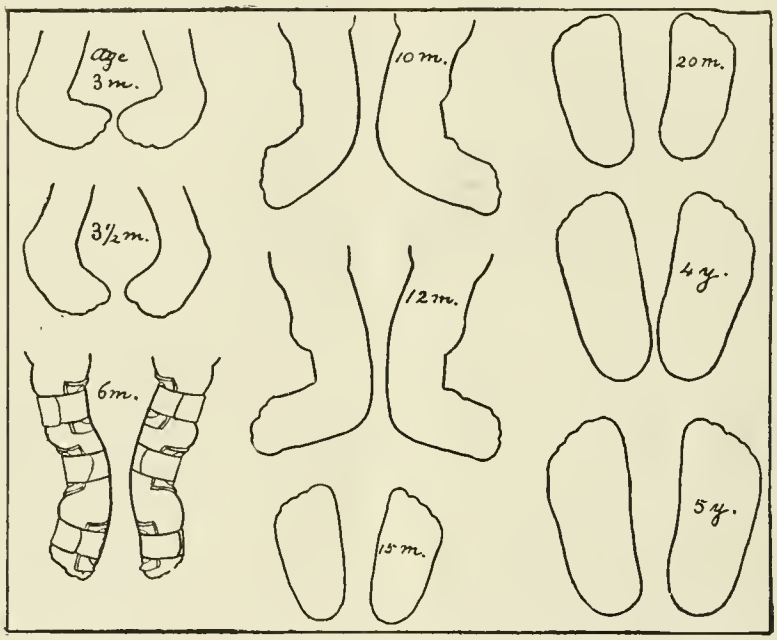
Dr. Freeman thought that tuberculosis would account for almost all symptoms shown by the child. The

joints of the fingers showed tuberculous disease; it has peritonitis and tuberculous pancreatitis. The same changes might be due to syphilis. He thought children seemed to have tuberculosis generalized.

Dr. V. P. Gibney said that he had heard that tuberculosis in children was generalized, but he thought the disease would not go on to tuberculous pancreatitis and involve the mesentery glands without also affecting the brain of the child. The tendency in these cases was rather to develop meningitis. Dr. Taylor said the case did not impress him as tuberculous. He thought a number of conditions were against that diagnosis—the joints showed that they contained fluid, but did not show much of anything else. The bones did not seem to him to be enlarged. He thought chronic white swelling had a distinct physiognomy of its own which this case lacked. He thought it true that fusiform swellings of the phalanges were in 99 cases out of 100 tuberculous, but this case did not show the ordinary features of such swellings. He thought syphilis would account after he had taken violent exercise—long bicycle rides, etc. The disease probably existed before, but was aggravated by the exercise. This boy does not seem to be particularly neurotic. Dr. Ely said he had seen a case of typhoid spine a short time ago, with osteitis of the vertebræ, with marked swelling in back, extreme sensitiveness, muscular spasm and limitation of motion.

**Congenital Dislocation of Left Hip, and Hip-disease in Right Hip.**—Dr. Napier presented a case which he showed for its unusual condition, and also to get the opinion of the section of the feasibility of reducing the congenital dislocation of one hip while there was tubercular disease in the other. Six years ago, operation had been advised for the dislocation, but refused. The child was not seen again until about 2½ years ago, when the diagnosis of tuberculous hip disease was made. This is still in active stage.

Dr. Lorenz saw the case at the King's County Hospital, and suggested the advisability of reducing the dislocation, putting it up in the usual position, and then




The figures show the increase in the size of a child's foot by natural growth, of which advantage may well be taken in the correction of talipes equinovarus.

for the fluid in the abdomen. The cases of floating cartilages, and movable bodies in several joints, he thought interesting and rare. He said he thought the case showing loud crepitation in the knees on motion was one of hypertrophied synovial fringes, rare in children, not so in adults. Goldthwaite has given the results of his study of these cases, with symptoms—sometimes intermittent, sometimes continuous, sometimes mild, sometimes very severe. They are called dried joints. These hypertrophied fringes may be felt at location of crepitus; if the joint should be cut down upon they would probably be found.

Dr. Northrup said the thickening was in the shaft, showing it was true thickening of the bone.

Dr. Hibbs said that he had been treating the case with mercury and iodide, as a means of diagnosis. He could not see any improvement. Had then applied apparatus as explained above.

Dr. Ely said that he had been questioning the boy with typhoid spine closely, and found he had had considerable discomfort ever since his attack of typhoid fever, but had not been bothered by great pain until including the right hip in the plaster spica, letting the child walk on the right leg. If the left hip should be abducted, the other is usually adducted, in order to bring the leg down so the patient can walk, and that would not be a good position for hip disease. The child is nine years old.

*Case II.*—This was also presented by Dr. Napier, who at first thought it to be a typical case of posterior curvature with lateral deviation. On examination on table, back was found to be a little stiff, as is often the case in posterior curvature. Slight swelling to the right of the dorsal spine, containing fluid, apparently following a fall he had in playing leap-frog, when he landed on his head. Since the swelling has appeared for the last two or three months, he has moaned at night, tired easily, and for the last month or six weeks has had a little difficulty in walking, and falls frequently. There is increased knee-jerks, and ankle clonus on both sides. At night has pain in dorsal spine. No angular prominences in spine. It is stiff in dorsal region, there is a round kyphosis, hardly more than round shoulders. On account of other symptoms, it

seems to be a case of spinal osteitis. The boy is now having difficulty in holding urine.

**Effect of Growth in a Case of Clubfoot.**—Dr. A. B. Judson.—The chart presents the history of a case of talipes equinovarus. Treatment was begun when the boy was three months old. There had been no previous treatment. The outlines were taken at 3 months, 3½m., 6m., 10m., 12m., 15m., 20m., 4 years and 5 years. The case is not presented for the purpose of illustrating the method pursued, or as an illustration of unusually successful treatment. The patient was before the Section in March, 1901, when the last outline was taken, one year after the restoration of normal shape and ability and the cessation of treatment. Fortunately such results are common, and becoming more common all the time, now that it is recognized that operative and forcible measures are not required in cases of this kind if the surgeon is freed from the necessity of being in a hurry and has the assistance of intelligent attention to the patient at his home. The chart is presented because it shows the increase in size which the foot acquires by its natural growth and brings prominently to view a fact lying at the base of orthopedic practice in general, the fact that our results in prevention and cure are to be sought and found in so managing the case and so equipping the patient that his growth will be the principal curative agent leading to symmetry and ultimate ability, which brings to mind the old saying: "As the twig is bent the tree's inclined," and also the derivation of the word orthopedic, in accordance with which we may say that orthopedic practice leads the deformed child to grow straight. The success in these cases is greater than it appears to be on the surface. Restoration of ability is still more important than restoration of shape, and in this also we are assisted by the patient's growth and development. If the bones are held in normal relation to each other the ligaments and muscles develop, by exercise, normal passive strength and active power with the increasing activity and weight of the patient.

DISCUSSION OF DR. NAPIER'S CASE II.

Dr. V. P. Gibney thought the case one of lateral curvature, primarily tuberculous, with paraplegia. Abscesses came with no angular prominences. May have had Pott's disease before.

**Etiology of Rickets, etc.**—Dr. Freeman made some remarks on this subject. He discussed the causes that had been suggested and the experiments that had been carried out to demonstrate that one or another of these causes was a real factor in the etiology of this disease, and showed that most of these experiments had given negative results. He then related certain observations made in New York by himself and others, on babies living in the tenements and in certain institutions, showing the remarkable frequency of this disease in institution children, even when their surroundings were hygienic and they were fed for the most part on breast milk.

Dr. Northrup said the first thing to do in the study of the cause of rickets was to clear the deck of all old theories which were not of service, and only consider those that were. He had found that babies having best of care in hospitals were as subject to the disease as those brought up in tenement houses.

Dr. V. P. Gibney said he did not know what caused rickets, and was simply there to admire the work of Dr. Freeman in collecting such valuable statistics.

Dr. Taylor admired Dr. Freeman's work, but thought the statistics were taken from far too few cases, and from far too limited a class of infants, to draw any very wide generalization. He thought results must be repeated by different observers for a number of years, before generalization could be made. He had noticed that dirty tenement children were no more subject to rickets than the well-cared-for, and thought the trouble was with the food. He thought sterilized more digestible than raw milk.

Dr. Nathan thought that where infants were nursed by their mothers, rickets were of less frequent occurrence.

## BOOK REVIEWS.

SURGICAL EMERGENCIES. The Surgery of the Head. By BAYARD HOLMES, B.S., M.D., Professor of Surgery in the University of Illinois, Professor of Clinical Surgery in the American Medical Missionary College, Chicago; Attending Surgeon to the Chicago Baptist Hospital. D. Appleton & Co., New York.

ALTHOUGH intracranial neurectomy of the fifth nerve and amputation of the tongue for carcinoma are scarcely to be classed as coming under the head of emergency surgery, still the present volume displays so many excellencies both of matter and arrangement that some trifling inconsistencies may readily be condoned. The preface seems to indicate that this is the first of a series of volumes which are to discuss the regional surgery of the entire body in such a way as to be most useful to the student and general practitioner.

The author has set himself to present the material in the manner most likely to produce a vivid and permanent impression and has succeeded in producing a most readable book, full of interest and profit for readers in every stage of professional evolution. The introduction of numerous histories of more or less dramatic cases is skilfully done so as to add point to the didactic material without impairing its continuity and is a valuable feature from the pedagogic standpoint. The entire domain of cranial and facial surgery, exclusive of the specialties, is covered and excellent advice given for the treatment of the commoner casualties, which are discussed in detail while the more unusual conditions are passed over with a lighter touch. Numerous illustrations and several colored plates adorn the text and help to confirm the favorable impression the volume makes.

VEASEY'S OPHTHALMOLOGY. A Manual of Diseases of the Eye. For Students and General Practitioners. By CLARENCE A. VEASEY, A.M., M.D., Demonstrator of Ophthalmology in Jefferson Medical College, Philadelphia. Lea Brothers & Co., New York and Philadelphia.

THIS is a valuable addition to the list of smaller handbooks on special subjects. A fair working knowledge of the diseases of the eye is as necessary to the general practitioner as the ability to use the stethoscope and we know of no other book which presents the outlines of the subject in so practical a way as this. The task of selection is great in the preparation of such a work and the author has been most successful in keeping his material within the limits of a manual without sacrificing completeness. Much is due to the very happy general arrangement and the systematic and concise way in which each subheading is discussed. The hand of the experienced teacher as well as of the skilful clinician is evident on every page and the result is very near perfection both from the standpoint of the student who seeks clearness and directness of exposition, and of the practitioner who requires a reference book for counsel in every-day work. Unlike many books of this class written mainly as text-books, this is a practical treatise and the department of therapeutics has been accorded

unusual space so that one will never turn to it in vain for hints as to treatment.

The illustrations are excellent and, for the most part, well chosen, though we think that albuminuric retinitis and optic neuritis, being the two conditions which the non-specialist is most likely to desire to recognize in his patients, might have been given a place among the colored plates rather than some of the rarer lesions so figured. The demonstration of tubercles in the choroid also sometimes forms the crucial point of a difficult differential diagnosis and a black and white cut, at least, of the condition should be included.

The American Year Book of Medicine and Surgery. Being a Yearly Digest of Scientific Progress and Authoritative Opinion in all Branches of Medicine and Surgery. Drawn from Journals, Monographs, and Text-books of the Leading American and Foreign Authors and Investigators. Collected and Arranged with Critical Editorial Comments. Under the General Editorial Charge of George M. Gould, M.D. Surgery. W. B. Saunders & Company, Philadelphia, New York and London.

The present volume of this excellent annual is well up to the high standard of its predecessors and offers a very satisfactory conspectus of surgical progress during the past twelve months. The collaborators have shown nice discrimination in their selection of material and the references bear witness that the most important surgical publications of the old and new worlds have passed under their eyes. The editorial comments for the most part are apt and give an added value to the sections they discuss while the abstracts themselves are models of concise but lucid expression.

Sections of especial importance are those on the surgery of the peritoneum and intestines, including an admirable description of the operation on President McKinley, and those on gynecology and obstetrics which are remarkably comprehensive.

The illustrations accompanying more important articles are reproduced in full; particularly interesting is the series of plates showing the results of Kelly and Brödel's study of the blood supply of the kidney with a view to the technic of nephrotomy. The index is comprehensive and the book is almost a necessity to every one engaged in active work.

Treatise on Diseases of the Eye, Nose, Throat and Ear. For Students and Practitioners. By various authors. Edited by William C. Posey, A.B., M.D., Professor of Ophthalmology in the Philadelphia Polyclinic, and Jonathan Wright, M.D., Surgeon to the Manhattan Eye and Ear Hospital, etc. Lea Brothers & Co., New York and Philadelphia.

This is the best book with which we are acquainted in the English language on the cognate subjects which it treats. Unlike many composite works of similar construction we believe that the editorial supervision of the work under consideration is very well done. The contributors, among whom are such well-known specialists as Alderton, Birkett, Casselberry, Cheatle, C. F. Clark, E. T. Collins, Crockett, Duane, Ellett, Gifford, Goodall, Hopkins, Miller, William C. Posey, Reeve, C. W. Richardson, E. A. Shumway, W. K. Simpson, T. H. Spencer, E. G. Starr, W. N. Suter, S. St. Clair Thompson, C. A. Vesey, J. E. Weeks, C. A. Wood and H. William, such an array of eminent authorities speaks for the scientific character of the book.

Comparisons between the different chapters are invidious and we therefore hesitate to pick out any that commend themselves especially to our praise. In fact all of the articles are of a high order. The illustrations are numerous and well chosen, and taken all in all we know of no work of similar character that fulfils its many useful functions. The new edition by the publishers in two volumes meets the only plausible criticism of the first edition, *i.e.*, its bulkiness.

Transactions of the American Orthopedic Association. Sixteenth Session, Held at Philadelphia, June 5, 6 and 7, 1902. Appendix. The published writings of the present active members. References to orthopedic literature published from May 1, 1900, to July 1, 1902. Volume xv. Published by the Association. Philadelphia.

This collection of papers read at the last session of the American Orthopedic Association contains much that is of interest to the general surgeon and to the family practitioner. Orthopedic surgery, dealing as it does essentially with chronic diseases and stretching its treatment over long periods of time, often demands the co-operation of the family practitioner whose skill is required in the case of intercurrent maladies. General practitioners and surgeons may very properly be expected to add a Year Book of Orthopedics to their libraries and these transactions afford a most satisfactory résumé of recent work in this specialty. Papers of particular interest are those on "Internal Derangements of the Knee-joint," by Peckham; "Congenital Dislocation of the Hip" and "A New Treatment for Fracture of the Neck of the Femur," by Whitman; and a very practical and profusely illustrated article on "Shoe Deformities," by Bradford.

Bacteria in Daily Life. By Mrs. Percy Frankland. Longmans, Green & Co., New York.

Popular treatises on bacteria and on their relationships to processes in the phenomena of every-day life are neither numerous nor well written. The present volume, however, is an exception to this generalization. It is written by one who is thoroughly acquainted with the subject from a standpoint that is distinctly non-medical and in a style which is charming. We can recommend it most highly both to the technical reader and to the physician, particularly as a work that he can recommend to his patients who are interested in bacteriology from the lay standpoint.

Laboratory Exercises in Bacteriology. An Outline of Technical Methods Introductory to the Systematic Study and Identification of Bacteria. Arranged for the Use of Students by Allen J. Smith, M.D., Professor of Pathology in the University of Texas. P. Blakiston's Son & Co., Philadelphia.

Laboratory manuals in bacteriology grow apace, but very few of them take up the study from the standpoint of the present author. His point of view is systematic bacteriology, a standpoint which we feel is absolutely essential in any modern treatise devoted to the subject of the science of these micro-organisms, and we thoroughly believe with the author that the best way to approach the subject of bacteriology, even for the medical student, is to enter through the channel of systematic bacteriology.

Bacteria being plants, their classification should be a purely botanical study. Their later physiological action and the detailed study of pathological forms, which are of so much interest in medicine would best be considered as a by-product of certain phases of these plants. It is only in this manner, we believe, that a comprehensive view of the study of bacteria can be gained and, therefore, the present outline is particularly to be commended.

# THE MEDICAL NEWS.

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## ORIGINAL ARTICLES.

### STOMACH VERTIGO.*

BY CHARLES SUMNER FISCHER, M.D.,
OF NEW YORK.

As the diagnosis of stomach vertigo is uncertain at best, and in view of the fact that the literature upon the subject appears at infrequent intervals, it would seem advisable before entering upon this discussion, to enumerate the principal characteristics of this form of vertigo, as described by Trousseau. According to this authority, they appear to be the following: there is no loss of consciousness and the patient never misunderstands the nature of his hallucinations; great fear attends the attacks; vision may be affected, objects may appear in a variety of colors, or all objects may revolve with excessive rapidity; pressure sensations may exist in the head and this form of vertigo does not occur when the head is lowered. The gastric symptoms described by Trousseau consist of pain in the epigastrium which upon pressure may radiate to the thorax, back, or even the extremities, and burning sensations within the stomach. Constipation exists as a rule, but there may be diarrhea. The attacks occur usually when the stomach is empty and may be relieved by taking food, or they may occur immediately after meals. At times all dyspeptic symptoms are absent.

It has appeared necessary to enumerate these principal features in order to establish some basis for the correct diagnosis of this condition, for it sometimes happens that cases are reported as gastric vertigo which do not give the clinical features of this form. I refer especially to conditions of intense cardiac, pulmonary, and cerebral disturbances, accompanied by vertigo, which occasionally follow attacks of acute indigestion. In such cases, the vertigo is but a part of a severe train of nervous and vasomotor phenomena which may follow indiscretions in diet, but it is not possible to regard the vertigo as the principal feature of these attacks.

The description of the cerebral phenomena given by Trousseau is clear, but the uncertain knowledge and classification of gastric diseases existent at the time did not permit of much specification in this direction, and hence, it has generally been accepted that stomach vertigo is an occasional accompaniment of chronic gastric catarrh, whatever this term might signify. As, however, the classification of chronic gastric diseases has been developed in succeeding years, the possible application of the term chronic gastric catarrh has become more limited and, as a result, attempts have been made from time to time to associate gastric vertigo with the various well-defined pathological conditions revealed by a more scientific study of diseases of the stomach.

A simple classification of chronic gastric diseases for the present purpose would be the following: (1) Disorders of secretion due to inflammatory or non-inflammatory conditions; (2) disorders of motility resulting in atony or dilatation; (3) displacements; (4) simple neuroses. Such a classification would tend to prevent confusion and it remains to be determined whether gastric vertigo can be associated with any one particular class mentioned.

Numerous attempts have been made in this direction. Ewald, Leo, Rosenheim and Fleischer regard vertigo as a possible complication of chronic inflammatory disease of the stomach. Boas, Pick and Herz attribute it to atonic conditions. Fleiner and Hemmeter look upon it as one of the many results of neurotic affections and Hayem and Robin suggest that it may occur in connection with any chronic gastric disease. A further difference of opinion exists as to the relation, if any, which may be present between the vertigo and the acid secretion of the stomach.

In this regard, Ewald and Leo would have it occur most frequently in connection with hypochlorhydria, while Fleiner, Riegel and Hemmeter suggest that hyperchlorhydria is usually found. There are others, among them, Fleischer, Rosenheim, Boas and Hayem who hold that any degree of gastric acidity may be possible during this complication. Various views have also been projected in regard to the frequency of this form of vertigo. Boas, Rosenheim, Hemmeter and Riegel look upon it as a frequent complication, whereas Fleischer and Hayem have rarely observed it. Singer, in an analytical discussion of the cases presented by Trousseau, denies the possibility of vertigo as a direct result of gastric disease and Hayem suggests that in most cases an eye or an ear lesion will be found to exist. Leube declares that vertigo occurs in 17 per cent. of cases of nervous dyspepsia and rarely complicates cases of dilatation.

The mechanism of production of gastric vertigo has been a subject for much speculation and, as Hemmeter suggests, rests entirely upon hypothesis. The older observers regarded it as a reflex phenomenon, but the manner in which such a reflex could be produced was a subject for theory based upon reasoning by analogy from observation of the effect of gastric irritation upon the heart's action and the pulmonary circulation. When Trousseau asserted that this form of vertigo was the result of reflex action through the sympathetic and vagus nerves upon the vasomotor centers, his assumption appears to have

* Read before the New York Academy of Medicine.

been verified by the observations and experiments of Mayer and Pribram upon the effect of gastric reflexes upon the pulmonary circulation. These experiments seem to indicate that irritation of the coats of the stomach may cause constriction of the arterioles in various parts of the body, thus producing increased resistance to and interference with the action of the left ventricle. Barie and Potain suggest, in this connection, that the reflex influence leads to a dilatation of the arterioles and labored right heart action. The same difference of opinion exists as to the condition of the cerebral circulation in cases of gastric vertigo. Trousseau maintained that cerebral congestion was present during such attacks, whereas Leube regards them as a result of cerebral anemia. Reasoning by analogy from Fleiner's observations upon allied conditions, such as hemicrania-gastrica, which according to him may be either sympathico-tonic or angio-paralytic, gastric vertigo might possibly be due to either cerebral congestion or anemia, assuming always that it is a result of vasomotor disturbances.

A further difference of opinion exists as to the routes pursued by these reflexes. Two possibilities appear in this connection. One of them carries the impulse directly from the stomach through the vagus and sympathic nerves to the cerebral centers. Those who accept this explanation, reason by analogy from the experimental studies mentioned above and from such cases as those of Leube in which a simple digital rectal examination or the passage of an ordinary lavage tube caused intense vertigo. I have encountered one such case, myself. It was that of an intensely neurotic woman in whom suggested rectal alimentation had to be abandoned on account of the servere cardiac and vasomotor and cerebral disturbances which would follow immediately upon the introduction of a nutrient enema.

The other theory carries the gastric reflex impulse to the centers of equilibration indirectly through the labyrinth. According to Woakes, the internal ear receives its blood supply from the vertebral artery and its branches, which latter also supply the inferior cervical ganglion. This receives a branch of the pneumogastric nerve and thus offers an explanation of the intimate relation existing between the labyrinth, the heart, and the upper part of the intestinal tract. The direct cause of the vertigo, if this conception is correct, would consequently be some irregularity in the blood supply of the labyrinth. In 1885 Menière accepted the theory of Woakes and attempted to prove by clinical statistics that chronic gastric diseases could cause ringing in the ears and even deafness. Of 24 cases examined, 43 are said to have complained of ringing in one ear, and audition was impaired in 50 per cent. All other theories are based upon these original statements of Woakes and Menière. Fleiner suggests in this connection, that the impulses might be transmitted from the stomach through the pneumogastric nerves to their centers in the medulla. These lie adjacent to those of the acoustic nerves If in neurotic individuals the centers for both these nerves have been irritated for a length of time, an impulse received in one might be transmitted to the other and thus lead to disturbance in labyrinthine pressure resulting in tinnitus aurium and vertigo.

Since the sweeping claims of Bouchard for auto-intoxication as the cause of all nervous phenomena attendant upon chronic gastro-intestinal diseases were first advanced, numerous attempts have been made to directly connect gastric vertigo with this condition. As little actual knowledge exists as to the nature of the toxines producing auto-intoxication, it is difficult to understand why in one case they should produce tetanie, and in another vertigo, except perhaps upon the uncertain basis of individual predisposition. Some assistance to a solution of these problems might be obtained from any definite knowledge which we might possess of the local gastric conditions under which the poisons are produced. Here, however, opinions differ again. Bouveret and Devic isolated their toxines from cases of hyperchlorhydria, whereas Cassalt and Féré extracted the same substances from normal stomachs. On the other hand, Brieger, Fleiner, Bamberger and Albu assert that these toxines can only be obtained from those cases in which fermentation and putrefaction are rendered possible by impaired muscular activity of the stomach. Boas contends that gastric vertigo can only occur in myasthenia gastrica and Pick in an analytical study of some 50 cases, reports an atonic condition in each one. Whatever may be the respective merit of these views, their practical development is more likely to lead to important results, for they have for their object the determination of the pathological conditions in the stomach necessary for the production of such phenomena as do occur in the central nervous system in connection with gastro-intestinal diseases.

That any actual relation exists between abnormal gastric acid secretion and vertigo has never been demonstrated and it appears to have been a matter of chance that some observers have reported hyperchlorhydria and others hypochlorhydria. This is natural when we consider that we may have any degree of acid secretion in connection with most chronic gastric diseases. Chronic gastritis, atony or dilatation, the various neuroses, and the displacements may show increased or diminished acidity, the extent of which will depend upon the duration of the disease and the pathological changes in the mucous membrane. If vertigo is associated with cronic gastritis in its early stages when proliferative changes are taking place in the mucous membrane hyperchlorhydria may be found. If, however, the disease has progressed to the atrophic state, hypochlorhydria will be present. The same rule exists for most of the other diseases, especially so for atonic conditions. The hyperchlorhydria which may occur in the early stages of atony and which is due to the prolonged irritation resulting from food stasis, will in time give way to normal

acidity and finally to subacidity in consequence of exhaustion due to overstimulation. I have seen attacks of vertigo repeated through these stages in the same case. The great fluctuation in the amount of acid secreted at different times in the same individual in the distinctly neurotic affections of the stomach renders the determination of any relation between this function and the vertigo extremely difficult and uncertain, and yet in this class of cases, vertigo occurs most frequently.

I have taken from my records a certain number of cases bearing upon these points. In these cases an exact diagnosis of the gastric conditions was assured by repeated chemical and physical examinations and both the slight and severe forms of vertigo have been included.

Of 50 cases of nervous atonic dyspepsia associated with vertigo, 66 per cent. were subacid and hyperchlorhydria existed in 10 per cent. Of 50 cases of purely nervous dyspepsia associated with vertigo, 42 per cent. were subacid and hyperchlorhydria was found in 17 per cent. Of 50 cases of chronic gastritis associated with vertigo 78 per cent. were subacid and hyperchlorhydria was present in 7 per cent. In 25 cases of dilatation vertigo was present in 7. Of these 4 were subacid. In 25 cases of gastroptosis vertigo was present in 5. Of these 3 were subacid. I have further found that in cases of achylia gastrica and hyperchlorhydria, taken irrespective of the underlying basis, vertigo occurs twice as frequently in the anacid variety as in the hyperacid.

From these figures it might be concluded that some relation did exist between subacid conditions and vertigo. That this is only apparent will appear from the following percentages of acidity taken from the same number and variety of diseases, not associated with vertigo. Among such of nervous atonic character, 33 per cent. were subacid and hyperchlorhydria was found in 11 per cent. Of the purely neurotic cases 39 per cent. were subacid and hyperchlorhydria existed in 20 per cent. Of the chronic gastritis cases 72 per cent. were subacid and 10 per cent. the reverse. Among the dilatation cases subacidity was found in 31 per cent. and hyperchlorhydria in 17 per cent. and of the cases of gastroptosis 60 per cent. were subacid and hyperchlorhydria was present in 10 per cent.

Such figures would seem to indicate that very little difference exists between the percentages of acidity found in the vertiginous and non-vertiginous cases. The excess of subacidity shows itself in both classes and the percentage of hyperchlorhydria is approximately equal in both. Whatever of value these statistics may have they at least demonstrate that very little relation exists between gastric acidity and the vertigo, for it is reasonable to suppose that if this were the case, that abnormal secretion which causes the greatest irritation, would preponderate. On the contrary, we see that the reverse is true. On the other hand, if subacidity were a causative factor in the production of vertigo, we would expect to find the greatest number of such complications among those cases in which subacidity is most prevalent, namely, cases of chronic gastritis. Vertigo is found, however, in only a small percentage of these cases. The greatest variation in gastric acidity exists among the neuroses and vertigo is mostly associated with these cases. It is well known that the abnormal acid secretion in such cases is the result of central nervous influence. This being so, any direct relation between gastric acidity and the vertigo becomes still more improbable, for the same impulse which increases or depresses the secretion is very likely to affect the vertigo through the cerebral centers responsible for this phenomenon. In truth, attacks of vertigo are just as likely to occur during periods of secretory depression as they are during periods of stimulation.

While there appears to be no connection between the vertigo and the various degrees of gastric acidity, it is still possible that an abnormal acid secretion might be the remote cause of the vertigo by inducing certain irritability of the mucous membrane and thus rendering it more impressionable. In this connection, however, it must be remembered that gastric irritability and gastric acidity are not always interchangeable conditions for achylia gastrica may exist for a long time without dyspeptic symptoms. It is further known that the diagnosis of hyperchlorhydria in certain cases is purely a relative one since through Talma we have learned that what is usually considered a normal quantity of free hydrochloric acid may, under certain local conditions of hyperesthesia, be regarded as a true hyperchlorhydria for that particular individual.

The simplest clinical indications of gastric irritability are pain and nausea, and if the latter is accompanied by vomiting, it may be regarded to a certain extent as an index of the reflex possibilities from the stomach. It would be interesting to know in what proportion of cases these two subjective symptoms were pronounced. An examination of the cases with this end in view reveals that in the purely neurotic cases with no atony and with vertigo, no pain whatever was present in 57 per cent., only slight painful sensations existed in 21 per cent., and considerable pain was endured in 22 per cent. In the same class of cases without vertigo the figures were practically the same, namely, 46 per cent. without pain, 28 per cent. with slight pain, and 26 per cent. with excessive pain. Nausea existed in these same cases in somewhat similar proportions. In those with vertigo it was absent in 50 per cent., occasionally present in 35 per cent. and pronounced in 15 per cent. In those without vertigo it was absent in 59 per cent., slight in 27 per cent., and pronounced in 14 per cent. These observations would seem to indicate that very little causative relation exists between gastric irritability and vertigo in the minor inflammatory affections of the stomach. In the inflammatory cases the proportions were practically the same. In the series representing chronic gastritis, with vertigo, pain and nausea were absent in 75 per

cent., while in those without vertigo the same symptoms were absent in 80 per cent., differences which are hardly worth considering.

In estimating the value of these statistics, it should be remembered that clinical statistics bearing upon chronic gastric diseases should always be taken with great reserve for here as no where else does so much depend upon the habits and surroundings of the individuals, so that what might be true for one class of patients under their conditions of life, might not be so for another class with entirely different conditions. Still, allowing for this contingency and taking a broad view of the results, it does appear that no determinable relation exists between gastric acidity, gastric irritability, and vertigo, a conclusion which corresponds with the observation of Trousseau who states that in many of his cases stomach symptoms were entirely absent. This view is further supported by the fact that vertigo is morely likely to be associated with the early stages of chronic gastric diseases than it is with the advanced changes in secretion and motility entailing pronounced suffering.

The frequent association of vertigo and atonic conditions in the stomach has led to the belief expressed in some quarters that this form of vertigo is always due to impaired motility or the fermentation resulting therefrom. There are certain facts to be considered in this connection. That vertigo should be associated most frequently with atony is comprehensible, for atony is probably the most common pathological condition known among chronic gastric diseases. It should further be remembered that most cases of atony have sprung from general neuroses with this result, that the nervous atonic dyspepsia is the most universally distributed. It will often be found, however, upon close examination that the vertiginous attacks antedate the gastric symptoms in these cases. Atony is not a common accompaniment of chronic gastritis, but vertigo does occur in a certain proportion of such cases. The same can be said of gastroptosis, whereas in cases of dilatation due to atony, the gradual transition from one condition to the other, does not result in increase in the frequency of the vertigo.

The impression which is effected upon the central nervous system for the production of gastric vertigo in cases of atony, may be accomplished in two ways. It may be the result of reflex action due to increased intragastric pressure from excessive gas production, or it may be due to auto-intoxication from toxine production. So far as the production of gas is concerned, it was found upon analysis of the cases given above that of the nervous atonic cases only 30 per cent. were afflicted with excessive epigastric pressure, whereas the cases of chronic gastritis gave this symptom in 70 per cent. In order to explain this discrepancy it would be necessary to assume that a combination of moderate gas production and excessive gastric irritability might exist, and thus produce the necessary reflex. When we consider, however, that these cases are usually subacid and that the suffering attendant upon them amounts to discomfort rather than great actual distress, the direct association of the vertigo and gas production becomes still more difficult. It should be remembered in this connection that most chronic dyspeptics are liable to ascribe all their symptoms to the excessive production of gas. In many cases, however, it will be found upon close examination that no reason for such exists and that all the pressure symptoms will disappear upon the administration of some local sedative.

As a certain irritability of the nervous system is necessary for the production of vertigo and as such irritability usually results in the course of chronic gastric diseases, it has been assumed by some authorities that the primary causative factor, under these circumstances, is auto-intoxication, thus offering a second possible explanation for vertigo in atonic conditions of the stomach. It is very probable, however, that other influences, such as malnutrition, are at work here also, for the fermentation resulting from food stasis may not only produce toxines, but in so doing convert a certain portion of the ingested food into products which are devoid of nutritive value. In this way, the general nervous irritability is explained and auto-intoxication stands as the remote cause for any of the nervous phenomena which may occur under these circumstances. Why in the one case the phenomenon should be vertigo, in other tetanie, and so on, can only be explained upon the uncertain basis of individual predisposition, which latter is again determined by the habits, occupation and surroundings of the subject. Hence, given gastric conditions which make auto-intoxication possible, we have in this a plausible but indirect explanation for the slight and momentary attacks of vertigo so common in the course of chronic gastric diseases. Auto-intoxication, however, cannot account for the vertigo in cases where no conditions exist for toxine formation, nor can it account for the sudden and violent form described by Trousseau. In the latter cases, it would be necessary to assume the sudden production and absorption of a large quantity of toxin, which is hardly conceivable without decided gastric symptoms. Where such rapid production does take place the reaction on the part of the nervous system is general and vertigo may or may not be an accompaniment of the complex disturbance. Added to this we have observations that the condition described by Trousseau is uncommon in cases of intense dilatation due to pyloric obstruction and yet these are the most fertile conditions for auto-intoxication.

This difficulty in connecting actual gastric conditions with vertigo is probably the chief reason for the various opinions in regard to the frequency, cause and diagnosis of this phenomenon. The simple association of vertigo with nausea and vomiting is not sufficient for the diagnosis of stomach vertigo, for all forms of vertigo, from whatever source, if persistent enough, will be accompanied by nausea, nor does the fact that

artificially induced vomiting will cut short an attack, render the diagnosis assured. Vomiting is sometimes induced for the purpose of relieving muscular spasm under other circumstances, so that it is reasonable to assume that it would act likewise in conditions of vasomotor spasm. It appears that cases sometimes are reported as gastric vertigo, simply because there happens to be some such association, when in reality, upon close inspection, it will be found that the gastric symptoms represent a result and not a cause. In other and more severe forms of nervous reactions, due to intragastric conditions, the vertigo is but a part of a disturbed whole to which the terms "dyspeptic asthma" or "angina" could be applied with equal felicity.

Such arguments appear to indicate that the determination of the frequency of gastric vertigo must depend largely upon a correct judgment of the factors which constitute this condition. Are we to take as examples only such cases, the type of which has been described by Trousseau, or can we include all cases in which vertigo and certain pathological gastric conditions happen to be associated. In the one case gastric vertigo would be rare, in the other, exceedingly frequent. In order to partially obviate this uncertainty, it would seem desirable to have some classification of the various conditions of association of vertigo and chronic gastric diseases. Such a classification must be imperfect at best for the various types will often run into each other, but even in an imperfect form, it may assist in differential diagnosis.

A classification, which would include the various types, is the following: (1) Cases in which the vertigo is intense and the only prominent nervous symptom. There may or may not be gastric symptoms and there may be no history of dietetic indiscretion. This is the type described by Trousseau; (2) cases in which the vertigo is associated with intense palpitation, precordial fear, dyspnea, and possible syncope following isolated acts of indiscretion in diet; (3) cases in which the vertigo occurs as a momentary sensation in the course of well-defined pathological conditions in the stomach. These types are given in the order of their frequency and the mechanism of production varies according to the one involved.

The first class assumes the existence of a chronic gastric disease with or without dyspeptic symptoms. There need be no act of indiscretion in diet and the discrepancy between the severity of the vertigo and the gastric symptoms is often pronounced. This may be so to such an extent that some authorities have doubted the existence of this type. Trousseau admits that in some of his cases the attacks were produced by regarding a revolving object and that a general tonic treatment was sufficient to reduce their frequency. These attacks occur with great suddenness and at times in individuals in apparent health. In rare instances, they may occur during sleep at night. A prominent feature is the great fear which attends them, an intense impression of impending evil. Beyond slight palpitation there need be no other symptom, and the attacks are usually of short duration. Sometimes they end in a spell of vomiting. They are usually infrequent, but may recur with a certain periodic regularity, one attack predisposing to another. The mechanism of production in these cases can only be a reflex for it scarcely seems possible to assume auto-intoxication as the cause, unless we acknowledge the sudden formation and absorption of a certain quantity and quality of poison calculated to produce the one symptom. The results obtained thus far by research do not justify such a view, and this type of gastric vertigo often occurs in individuals whose gastric conditions do not admit of auto-intoxication. On the contrary, it rarely occurs by itself in advanced stages of atony or dilatation. There are no specific gastric states with which this type can be directly connected and fortunately the cases are rare.

The second class of cases occurs more frequently than the first and can usually be traced to some dietetic indiscretion. It seems hardly justifiable to call these cases *gastric vertigo,* for the latter is not the principal feature of the attacks. These patients have indulged in either a too hearty or an unusual diet and are suddenly seized with severe epigastric pain and pressure which is followed by intense palpitation, dyspnea, vertigo and possible syncope. There is some danger of a fatal termination in these cases, whereas simple gastric vertigo can have no such ending. The mechanism of production here is more complex than in the first class. It consists of a mechanical, or reflex interference with the heart's action due to intragastric pressure as a result of the rapid production of gas. This in turn leads to interrupted pulmonary circulation causing the dyspnea or irregular cerebral circulation causing the vertigo. The latter may also be caused by the intense fear which usually accompanies such attacks. That auto-intoxication should be responsible for some of these cases may be a possibility provided a sufficient length of time has elapsed between the onset of the attack and the dietetic indiscretion. Many of these cases, however, occur very shortly after meals at a time when fermentative or putrefactive changes in the food could not be very far advanced. Here auto-intoxication is out of the question, for it is usually a slow process, whereas the onset and course of these attacks are sudden, rapid and alarming. They are cases for the nearest doctor, and their frequency lies midway between the first and third types.

The third class comprises those cases in which the vertigo is associated with chronic gastric diseases as a momentary sensation. Such cases are numerous, but the evidence of any causative relation existing between the vertigo and the gastric disease is often very obscure. A general neurosis usually is present at the same time and the diagnosis of gastric vertigo will depend largely upon

the time relation which exists between the neurosis and the gastric disease. Should the etiology show that the neurosis existed before the stomach symptoms set in, the vertigo will probably be of the neurasthenic variety. If, on the other hand, the neurosis developed as a result of the gastric condition, the vertigo may be due to the latter in so far as the stomach can be looked upon as the remote causative factor. This, however, does not imply that this organ can be accredited with the immediate attacks, for we have seen how difficult it is to connect such an attack with the individual gastric symptoms. I am inclined to believe that in the majority of these cases the vertigo is due either to external influences affecting the special senses or originates in the central nervous system as a result of a predisposition engendered by the mental depression or irritability and general loss of confidence developed by long suffering. Agarophobia is commonly associated with the vertigo in these cases and often precedes the attacks. This loss of the sense of security is conducive to a loss of equilibrium so that such patients soon find themselves in a condition of "vertigo fear" (Schwindelangst—Brücke). Sudden fear or shock is very apt to produce disagreeable and even painful epigastric sensations which, in cases of nervous gastric diseases, may lead to nausea and vomiting. In this way, the stomach is often immediately associated with attacks of vertigo, when in reality, the rôle played by this organ is purely secondary.

It has seemed advisable to direct attention to these few facts on account of the tendency to shift upon the stomach the responsibility for a lot of nervous phenomena which happen to appear in the course of chronic gastric diseases. In this connection, Van Noorden regarded melancholia in the light of a gastric secretory neurosis, because hypochlorhydria happened to be present in twelve cases. Clozier claimed that the majority of hystero-neuroses were due to congestion of the whole abdominal system. Faber, while admitting that zones of hyperesthesia might exist in chronic gastric disease, suggests that a general neurosis must be present also. Other examples are the so-called stomach cough (Ball), loss of sight after hematemesis (Graefe), tinnitus aurium (Menière, Levan), neuralgia of all kinds (Debu) and, finally, a case of labioglossolaryngeal paralysis due to vagus neuritis, starting in the stomach and leading to bulbar myelitis (Cuffer). Suggested and then denied, these few theories are only specimens of the numbers which have appeared from time to time, and can serve to demonstrate the necessity for a detailed analytical study of the etiology and symptomatology of each gastric disease, for mere association or the effect of treatment upon such a disease cannot guarantee the existence of a causative relation between the two. Many remote effects of malnutrition may be affected by treatment of digestive irregularities and patients are naturally very apt to attribute all their ills to a deranged stomach, for no organ affects the disposition or directs attention to itself to such an extent as does this one.

When we consider, moreover, the number of pathological conditions of other organs which are said to produce vertigo by reflex action, it seems advisable to limit this possibility from any particular one, for "by reflex action" must be an uncertain explanation at best. In this connection, I will only mention laryngeal vertigo (Charcot), cardiovascular vertigo (Grasset), aural vertigo (Menière), retinal vertigo (Mendel), nephritic vertigo (Bonnier), epileptic vertigo (Hitzig), rectal vertigo (Leube), neurasthenic vertigo (de la Tourrette), and infectious vertigo (Gerlier).

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## NOTES ON THE SELECTION OF A CLIMATE FOR THE TREATMENT OF TUBERCULOSIS.*

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No factor at our command to-day is more potent in effecting a cure, and, in the majority of cases, in ameliorating the symptoms of tuberculosis, than the influence of a proper climate. With new research laboratories planned on a gigantic scale, with their corps of workers seeking to stamp out disease, and especially "The Great White Plague," I believe that some method easy of application will be soon secured to cure and exterminate tuberculosis. Until these novel research workers tell us of their discovery, however, the general practitioner and the health boards of our municipalities must put their trust first and foremost in a land where sunshine is longest, relative humidity lowest, and yet with sufficient altitude and certain necessary atmospheric conditions to produce the essential results. The Health Board of this city, with the cooperation of such men as Lederle, Biggs,

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Loomis and Wilson is to-day doing its utmost to stamp out consumption and, at the same time, to effect cures with the limited means at its command; the establishment of its new tent colony is greatly to be commended. But, even the Board of Health with its able coadjutors is too heavily handicapped in its work by the enormous mass of foreign immigrants poured in on us weekly. Many of them come from rural districts, and take up life here, compelled to face the changed climatic conditions of a city, a climate ready to develop in them tuberculous infection. Those of us who have worked among them on the East Side, know full well of their poorly nourished bodies, with systems only too ripe for the infection to be found in the overcrowded and unsanitary quarters they must necessarily occupy.

In my opinion, infection would be greatly lessened in the city if, on sunshiny days, all employes were compelled to take their midday meal away from the building in which they are employed; or else that their places of business should provide roof gardens, or sun-rooms, for this purpose. The use of prisms, humidifiers, modern automatic ventilating apparatus and possibly the new glass paint just discovered by Galpin, especially in the construction of lofts and buildings set aside for large colonies of workers, should be more urgently insisted upon. Another suggestion occurs to me that in all factories, sweat-shops and places where the number of cubic feet of air is far below normal for the workers employed, at least once in twenty-four hours the floors should be sprayed with a solution of formalin of not less than 1 to 5,000 strength; or formaldehyde vapor should be liberated in the same space. The use of recreation piers enclosed in glass in winter seems advisable.

When we look into the climatic condition of New York and compare it with other localities, we can readily realize that something must be done if we are ever to check the development of this dread disease.

New York State, covering an area of 49,170 square miles, in 1900 had an estimated population of 7,268,894, or 152.6 people to the square mile. Of this, New York City alone, with an area of 308 square miles, had a population of 3,437,202 people for the same year, or an average of 256 the square mile. On the other hand, Arizona, occupying as it does 113,020 square miles, shows a population of 122,931 in 1900 (24,333 of which are foreign born), or an average of 1.1 persons to the square mile; Colorado, an area of 103,925 square miles, with a population of 539,700 (91,155 of which are foreign born) shows an average of 5.2 persons to the square mile, or Denver, covering 54 square miles, having a population of 150,000; New Mexico, with an area of 122,580 square miles and a population of 195,310 (13,625 of which are foreign born, shows an average of only 1.6 people to the square mile).

The statistics for probably the worst month in the year for the growth of bacillus, *i.e.*, March, are as follows: In 1901, March showed only 49 per cent. of sunshine, or 182.7 total hours.

Under the existing conditions of life to-day I believe it is impossible to cure tuberculosis in the City of New York, and I look upon it as an error of judgment for any medical man to keep a case, especially in its early stages, in this city. For nearly one year I lived in that region of the United States in the Rocky Mountain chain, extending from the middle of British Columbia, on the north, to the City of Mexico. During that time I had the opportunity of studying carefully the character of this region in all its particulars, with a view to finding the most suitable place for the treatment of the different stages of tuberculosis. During my investigation I became convinced of the advantages, especially offered by places in Colorado, New Mexico, Arizona and Western Texas. I have also spent some time and pursued my investigations in the Adirondacks and parts of North and South Carolina, and in my opinion, residence in these districts, under proper conditions of hygiene, sanatoria and tent life, helps to prolong life, ameliorate suffering, and probably effects some cures. These sections, however, compared most unfavorably with the selected territory of the Rockies previously mentioned, on account of the lessened altitude, unusual humidity, fogs, great rain and snowfall, the increased wind currents, markedly variable temperature and, consequently, the decreased number of days of sunshine and strength of sunrays, in some instances also, the proximity of large centers of civilization.

With the vast wealth that New York City commands, it seems not only possible, but imperative, that large sanatoria should be built in places best suited for the cure of this disease. It matters not whether the colonies to be established be municipal, state, philanthropic or national—this is a question that cannot be too strongly presented to the community, for it touches every man, woman and child who resides within the bounds of our city.

A consideration of the geography and meteorology of the Adirondacks seems useless, as every medical man interested in this subject is absolutely familiar with this region. Undoubtedly the proximity to the St. Lawrence Valley tends to greatly increase the moisture and rainfall of this district. Then, the altitude is not to be compared with that of places west of the Mississippi. The work of Trudeau and the elder Loomis is quite familiar to all of us and, in passing the Adirondacks, probably the best places are the Adirondack Cottage Sanatorium, accommodating about 100 people, and the Saranac and Lake Placid regions, with a relative humidity generally of about 73 per cent.; 132 clear days are observed, 104 partly cloudy and 129 cloudy. Rain falls from 30 to 40 inches. One might also mention the village of Ray Brook, situated in the heart of the pines, a short distance from Saranac Lake. The air here seems antagonistic to the growth of the bacillus as it is never found in the

cattle of the region. The altitude is about 2,300 feet, the altitude of Saranac Lake being about 1,800 feet.

"Of 173 patients 45, or 26 per cent., were discharged as cured; in 79, or 45 per cent., the disease was arrested; 39, or 22 per cent., were discharged in an improved condition; 4 were doubtful and 1 died.

In 40 incipient cases, after a residence in the sanatorium of from 3 to 17 months, 33 were discharged cured, in 6 the disease was arrested, and 1 improved.

In eighty-four advanced cases twelve were cured, in fifty-five the disease was arrested, fourteen improved and three did not improve.

In seventeen far advanced cases the disease was arrested in six cases, ten improved and one did not improve.

Of 141 cases 133 gained on an average of fourteen pounds in weight, five lost weight and three remained stationary."

A charitable philanthropy, much to be commended, now nearing completion, is the Stoney Wold Sanitorium, a station or two above Paul Smith's. It will undoubtedly fill a long-felt want in caring for the more deserving classes of the poor. Unfortunately, it is situated in the wake of civilization, and one will be almost able to shake hands with the patients from the railway carriage, and certainly patients cannot escape breathing the smoke-laden air from the passing trains. The consumptive must avoid civilization, so to speak. His home for at least a certain portion of the year, if we could achieve the ideal, would be in the fast-fading wilderness.

The district near the town of Liberty, New York, should be mentioned. The soil is loam and clay, and the average altitude is about 2,300 feet. The snow generally remains most of the winter. The statistics of the Loomis Sanitorium undoubtedly point to this as being a fair place for the tuberculous.

Advanced cases seem to do very well in Aiken, S. C., a very low altitude, but, for unexplained reasons, quite the driest place east of Denver. The mountains of Western Pennsylvania offer some advantages, while the pine belts of North and South Carolina, probably influence some cases.

Northwestern North Carolina, with an altitude of 5,000 feet, especially near Cæsar's Head, Blowing Rock and Hendersonville is also good, provided one can get good accommodations. The best way to pass the time in either of these places is in tents or log cabins. Asheville, N. C., has been thought well of by some medical men for years, but it seems to me to be overcrowded, and has an altitude of only 2,339 feet, a relative humidity of 65 per cent., and plenty of red porous clay.

Occasionally a tuberculous case will do well at the seaside resorts, and the Island of Nantucket offers a balmy climate in summer, while Southport, near Wilmington, N. C., with 54 per cent. of sunshine, makes an all around delightful annual resort, if one can believe the seashore is to be advocated.

Dr. Cohen mentions Boerne, Texas, as an admirable place, and recently I have heard good things said of San Angelo, in Southwestern Texas. Many English people have gone there. The life is good, and the encouragement of outdoor sports adds great charms to the place. In passing, one should mention El Paso, Texas, with 3,754 feet of altitude, 49 per cent. mean relative humidity, moderate winds, protected northwest and south by the Rocky Mountain spurs. It is becoming quite a popular resort from September to May for those who are going West, but wish to try a moderate altitude for a few months. Laryngeal cases are said to do especially well in this locality. The heat of Texas makes it a land to be avoided, however, in the summer months.

For almost every case of tuberculosis, however, especially when it is now possible to make a railroad journey of three days so comfortably, the ideal vantage ground of the world to me today is the State of Colorado and the Territories of New Mexico and Arizona. So important do I look upon this district that I deem it advisable to describe in detail the country, the life to be found there and the permanent advantages afforded the sufferer—the anemic, the chlorotic, the predisposed, as well as the sufferer from tuberculosis.

Undoubtedly, either through travel or reading, we are all of us more or less familiar with the great West, but I would like to call your attention briefly to that portion of it which I consider ideal for the tuberculosis patient, namely Colorado, New Mexico and Arizona. We will take Colorado first. This State is situated in the central belt of States in the Rockies, and you will find that in Colorado the highest development of the Rocky Mountains is reached. It abounds in numerous lofty peaks, many of them over 14,000 feet elevation, notably Pike's Peak and Long's Peak. The eastern part of the State is a vast plain, sloping away to the Kansas line, with an average elevation of 4,500 feet. The western and central portions of its area are occupied by an intricate plexus of wild and irregular ranges, enclosing valleys known as "Parks," most of which are extremely fertile and well wooded, and it was in these parks I spent a most enjoyable sojourn, and about which I am especially enthusiastic. The delightful life one can lead here recalls memories that only the realization of one's ideals can equal. The northwestern corner of Colorado is the land for the boy and girl between the ages sixteen and nineteen years. A summer, the nights of which are spent in a sleeping-bag in a tent, or lean-to, would destroy all chance of infection, which children of the more highly bred, may have in their bodies. These parks are hemmed by thick forests of spruce and fir, and the very air seemed so heavily impregnated with the delicious antiseptic vapors as to make it, in itself, almost possible to sustain life. Ozone is

said to be greatly increased in these piney woods by certain chemical changes, which take place in the leaves, about which very little is known as yet, and which yield a salubrious effect. The sun's rays are hot, invigorating and delightful in the summer. Many early cases are sent up into these picturesque park lands in the northwestern corner, where I camped among the multicolored flowers and rushing streams, the balsams, firs and cedars. The projected railroad between Denver and Salt Lake City will make this land, now only available by pack trains, the vantage ground for the summer, and for a great sanatorium, National, I trust. The altitude is from 7,000 to 11,000 feet. The coldness and crispness of the air of these higher altitudes gives out a drying, tonic effect, stimulating and strengthening the invalid, and exercise a most inhospitable attitude toward this bacillus and the germs of pus. I have seen miriads of mosquitoes in a belt a mile wide, feeding so furiously as to stampede the pack-horses, but as the sun faded over the hill all insect life was stilled, and we slept with the greatest comfort. With all this the voice of nature is supreme, which means local immunity, the density of the population being hundreds of times less than in a city, and the life absolutely free from chances of infection. The effect of the change from the cities is good and the "advent of a tuberculous fire, which had rekindled in Denver, has been effectually stamped out by a sojourn in these parks."

Speaking generally of Colorado, however, the precipitation of winter is almost wholly in the form of snow. In the plains and valleys it is light, but, of course, this fall is very much heavier on the mountain slopes, and is apt to last into April and May. The rainfall in the mountain regions increases in July and August, but take it altogether, the climate is dry and healthy. There are no fogs, a low atmospheric pressure, an average wind movement of about seven miles an hour, and a marked difference in the sun and shade temperature; for instance, at two o'clock in the morning one requires the heaviest blankets and coats to keep warm, while at twelve o'clock noon it is almost impossible to ride in the sun. Aside from being a favorable climate for tuberculosis, Gardner concludes that the climate of Colorado exerts a most beneficial effect in all diseases of the gastro-intestinal tract characterized by diarrhea, *i.e.*, enterocolitis, cholera infantum, dysentery, etc., and the death-rate among infants and children from these causes is excessively small in Colorado as compared with other States. Then, too, the milk supply, due to non-septic air, moderate thermometric range, and, in most cases, the splendid physical condition of the cattle makes possible a far better nutriment in bottle-fed babies; while the mother who nurses her child has the added advantage of healthy, life-giving environment, and must necessarily impart to her baby the vigor derived from air and sunshine. You can readily understand, therefore, that the climate of Colorado tends to encourage and make possible a more perfect and higher physical development in the child.

To return to our subject-matter, you can readily see from this brief description, that Colorado is eminently suited to the requirements of our tuberculosis patients. Let us take Denver, for instance, which I always think of as "The Parlor City of the Plains," and which is justly famous as "The City of Beautiful Homes." Many consumptives are attracted to this city, owing to its beauty and healthfulness. Certainly the number of active, wealthy and useful business and professional men who have recovered their health and strength in its environments, and have finally made Denver their home, constitute one of the strongest endorsements for the healing properties of Colorado's climate. It shows a record of 42 per cent. of clear days, as against New York's 27 per cent.—New York double the amount of cloudiness. Then, there are no lack of splendid accommodations, either in hotels or boarding houses, the best board in private houses ranging from $8 to $10 per week.

I cannot too strongly impress upon you the cruelty, if not danger, of sending a patient to any resort if he has not the means of procuring all necessary comforts, at least until he has so far recovered as to permit of his engaging in some pursuit, which will aid him financially. The consumptive, as a rule, is imbued with the idea that the change to a good climate is going to cure him very shortly, but we who know, realize the months, and sometimes years, which will ensue before a cure is effected. The more advanced the disease the greater responsibility rests upon the doctor in recommending a change, unless the patient's finances can stand the drain, which is sure to come. The Oakes' Home for Consumptives in Denver is well thought of.

Colorado Springs, a city of 25,000 inhabitants, with an altitude of 6,022 feet, offers, in my opinion, the greatest all around advantages of any place in this country. Its days of perpetual sunshine, its charming life, its great dryness, and I do not now recall one cloudy day in the spring and summer of 1894: its environs, delightfully hospitable people—everything done for the invalid by those who are now cured, makes it stand foremost to my mind as an ideal place. It should be avoided, however, by those over fifty years old, and the advanced cases, unless they have been accustomed to living in high altitudes, say of 3,000 feet, for at least several months. Probably one of the best hotels in this country now stands upon the ashes of the old antlers. Broad avenues, mesas, country clubs, polo, coursing with hounds, beautifully furnished houses, with an ideal climate, associated with many of Nature's grandest works—canyons, formations, and curios (for instance, "The Garden of the Gods") —the only flaw being an occasional wind-storm. Females should be well veiled, and while driving should avoid the eye of the gale. Colorado Springs has no mud. Snow in the morning is evaporated or soaked into the ground within

three hours. I understand that General Palmer has granted a number of acres near his very attractive home "Glen Eyre," between the "Garden of the God" and Manitou Springs, for a sanatorium, but until this section has a great reservation with sanatoria or tent colonies in its vicinity, I would suggest it as best suited to the wealthier class of invalids. Patients should take life easily at first until they become acclimated. To-day I know of several cases of advanced tuberculosis, who, after a sojourn of from one to five years in Colorado, are now able to live in the very heart of New York. Drs. Gardner and Solly believe that Colorado Springs affords greater opportunities in the earlier stages than any other place in the foot-hill region. As I look back upon the hours I spent at Colorado Springs, with its luxuries, its varied charms and its glorious climate, I can only call it the "Newport of the Rockies—"The Paradise of the Mountains."

From Colorado Springs one goes to Manitou Springs, a delightful place sheltered by Pike's Peak, but lacking many of the advantages of Colorado Springs. Dr. John A. Robison is especially enthusiastic regarding this place, and calls our attention to the following cases: "I wish to relate one experience that I have had in sending patients to a high altitude and its effect upon the hematopoietic processes. I had under my care two young women with predisposition to tuberculosis. About two years ago one became profoundly anemic, and there was a slight tuberculous deposit in the right apex. I sent her to Mont Claire Sanitarium at Manitou. She remained there all winter and the following spring, and since returning to Chicago has been in perfect health. I never saw such a transformation, with the exception of that in her sister. When she went to Manitou she was chlorotic, her lips were almost bloodless. When she returned she had rosy cheeks, had gained in flesh, the tuberculous deposit had apparently cleared up and she has been in perfect health since. Last winter her sister became chlorotic, but there was no deposit in the lungs, and I sent her to Manitou. She returned in the course of a few months, having gained fourteen pounds. Her cheeks were rosy, her lips red, and she has retained her health ever since. These are two examples which show that the change of climate from Chicago to Colorado quickened all the blood-making processes, and it did not require a blood-count to demonstrate it."

Before leaving Colorado, I would like to say a few words regarding Boulder, where is situated the State University. This town also offers many advantages and attractions. The places at Middle Park and South Park, where the altitude is from 7,000 to 8,000 feet, are also to be considered, especially in the summer time. Glenwood Springs, twelve hours west of Colorado Springs, offers fair advantages, but is recognized more especially to-day as the best outfitting place for camping parties going to the northwestern part of the State. Estes Park, at an elevation of 7,500 feet, San Luis Park, at an elevation of from 10,000 feet, surrounding a beautiful lake, might all be mentioned as healthful spots. One must not forget the sanatoria at Falkenstein Gerbersdorf, showing an average of 51 per cent. of cases benefited, and Reibolsdorfer, with a record of 56 per cent. of cases benefited, each at an altitude of from 1,375 to 2,300 feet, with Colorado at 70 per cent.

We may now take up New Mexico. The whole surface of this territory is generally mountainous to the Arizona line, though a central valley of an average breadth of 20 miles extends across it from north to south. This valley is hemmed in by the main chain of the Rockies, many of the mountain peaks here rising to an elevation of from 10,000 to 12,000 feet. The higher ranges are covered in many places with pine forests, and lower, with cedars and occasional oaks. The climate is generally temperate, the rainfall, which comes very largely in July and August, averaging about 13 inches. Very few points receive as much as 20 inches during the year, the greatest rainfall on record being 35 inches at Old Camp Grant, N. M., in 1871. The winter rains begin about December, and practically end in March, and rarely fall as heavily as during the summer, being more or less irregular. The wind movement is less than in Colorado, but the great sand-storms sometimes occurring in the spring make it objectionable. The whole territory is practically one of sunshine and sand. So pure and dry is the atmosphere that meat hung out in the air to dry will not decompose. It is simply a splendid place for consumptives; the natives themselves seem to be entirely immune from its infection, and really do not know what the word "consumption" means in this connection. The winter climate from Albuquerque, south, is superb, but during the summer it is too warm for most patients, and its distance from most centers of interest, combined with the eternity of sand and sunshine, renders the life here sometimes a little monotonous. The only pleasure one could derive from the country would be in "roughing it," but, of course, the tuberculosis patient could not endure such fatigue at the start. By far the best part of New Mexico, considered from the standpoint of a health resort, is situated in the northern portion of the territory. The winters are mild and open, with scarcely any rain or snow, and the summers are cool and delightful. The thermometer during the winter averages about 45° F. at noon, while in summer it rarely registers above 80 degrees.

Santa Fé, the principal city, is situated in the vicinity of the loftiest peaks in the territory, and one finds it a delightfully quaint old place, still half Mexican. The summers here are enjoyably cool, dry and exhilarating, though the altitude (7,000 feet) is too great for most patients. St. Vincent's Sanitarium might be mentioned in connection with this city. Here the best of accom-

modations can be obtained at fairly moderate rates.

Albuquerque is another of the chief cities, and lies but twenty-four hours from Denver, at an altitude of 5,000 feet. To my recollection the hotels are not of the best, though there are many good boarding houses. The winters are warm and pleasant in this locality, while the summers are fairly hot, although the nights are always pretty cool. Albuquerque probably has the best climate in the southwest, although the fact that the place is overcrowded with invalids, and the lack of good accommodations is noticeable, makes the place more or less undesirable.

Silver City seems to me to afford especial advantages to those suffering from tuberculosis. It has an altitude of 5,800 feet, and the winter and spring climate is excellent. While I have never visited Silver City, I have corresponded with a patient there recently, who tells me the accommodations there are exceedingly crude, the difficulty in getting the best food very great. From what photographs I have seen of the place I should judge it to be a bustling mining town more than anything else. Throughout this region numerous small parks are to be found, and these offer a most agreeable respite during the summer months. Most of the houses are adobe huts, and it is advisable to provide a tent with sleeping-bags for the patient going into this district.

There are only two other cities in New Mexico worth mentioning, viz., Las Vegas and Las Cruces, both possessing many excellent advantages.

One notices on arriving at the resorts of the great southwest, where the altitude is over 4,000 feet (for instance, Colorado Springs, Denver, Albuquerque, Santa Fé, Silver City, etc.), how distinctly rare the air is. This, with its lessened amount of oxygen, makes us take the deep breaths, thus increasing the circulation, opening up the minutest ramifications of the lungs, and rapidly increasing chest expansion. Then, too, is observed the healing, invigorating and stimulating effect of the brilliant sunshine, sometimes as high as 120 degrees, and when the shade is sought the marked difference in temperature is felt. Occasionally the air may have a few particles of dust, but when we analyze it we note its great purity, and the total absence of fogs and mist. The sun-rays of the mountains and foothills of the Rockies contain a large proportion of the blue end of the spectrum, and these rays have marked bactericidal and germicidal powers. It is these rays that undoubtedly give the marvelously gorgeous tints to the gentians, daisies, and other wild flowers so familiar to all of us who have camped out in the summer at high altitudes. The rapid action of light, the early dawn and the prolonged twilight are two especial features of Colorado Springs, and mean for the patient outdoor life and pleasure. In summer, where most of the rain falls in almost cloudburst effects, the air seems greatly cleansed, and this cleansing, if at all necessary, seems to last for the year.

The rainfall of the foothills region east of the Rocky Mountains ranges from 10 to 18 inches, and it increases slowly toward the one-hundredth meridian. Eastward of that meridian the annual precipitation varies from a little under 20 inches to about 60 inches on the Florida and Gulf coasts. There is a gradual decline both from the Atlantic Coast westward and from the Gulf Coast northward. The diminution in fall from New Orleans northward to St. Paul is 32 inches; from Eastport westward to St. Paul, 12 inches.

I have always noticed that while snow came rarely and was rapidly evaporated, blown away or soaked into the sandy soil, it seemed to markedly intensify the light and increase its powers of reflection.

But we must not overlook Arizona, which is preeminently the land of sunshine. The physical features are: The mountain system appears at the southeastern corner of the Territory and extends in a general northwesterly direction to the borders of Utah and Nevada. More than half the territory is above the 5,000 foot contour line, and forms a part of the great plateau region west of the Rocky Mountains. About one-third of the territory is sandy plain gradually rising in elevation from less than 100 feet at Yuma, to a rather narrow bench or mesa that faces the plains about 180 miles northeast of Yuma. The elevation of the mesa ranges from 3,000 to 5,000 feet above sea-level. Beyond it to northeast is the high plateau of Arizona. Annual rainfall of this region ranges from 10 to 20 weeks. About 35 per cent. of the rain falls in July and August. May and June are generally the months of the least rainfall. The summer rains are essentially a feature of the mountain and plateau systems, and are believed to be due largely to local convection induced by excessive insolation on the barren, rocky surface of the mountain sides and summits. The winter rains are believed to be due to migratory areas of low pressure pertaining to the general system of storm movement. The character of the winter rains, whether light or heavy, depends largely on the frequency of atmospheric disturbances. Yuma, in the heart of the desert, shows 84 per cent. of sunshine. Mr. Whitelaw Reid compares the climate of this territory to portions of Egypt. He believes it to be even sunnier, drier and more delightful than the district around Luxor or Assouan. I have traveled all over the territory, and spent some delightful days shooting in the famous wide valley, 40 miles northwest of Prescott.

Prescott offered a few years ago no special advantages to the health-seeker; it was purely a mining and ranching town and was slushy and muddy in the spring.

Flagstaff, with its 7,000 feet of altitude, is charmingly situated in the wilds of mountain forests. The eastern invalid can look especially to Tucson, Phenix and Crede for comfort, climate and charm. Phenix is in the midst of an

oasis where the air is somewhat more humid, which is brought about by the increased irrigation. Tucson, with 42 per cent. humidity, is 121 miles southeast of Phenix, is 2,300 feet high, and is quite a modern southwestern town. Arizona possesses all the elements of a climate suitable for advanced cases—those along in life or where the condition of the heart muscle is a consideration. The fruits and flowers of Phenix have alone made it famous. Arizona is crossed by two great railways, and its sanddunes are becoming more and more an object of interest to transcontinental travelers. The ranchman and the eastern boys will rapidly open up the territory. I feel safe in predicting that many charming little towns will soon spring up where the altitude is below 3,000 feet—the winters will be balmy and the summers will not prove oppressively hot, as irrigation and humidity must be considered. The rainfall is often less than seven inches.

The place most highly spoken of in Arizona, and which, I trust, will soon have railway connection, is Oracle, 38 miles from Tucson, has 4,500 feet altitude. One writer calls it a "pretty mountain nook embowered with live oaks:" it undoubtedly possesses great advantages.

In parting with the wild regions of Arizona, so essential to-day in curing tuberculosis, my mind naturally reverts to the question of tents. Let me mention the Fitch & Abercrombie waterproof silk tent, 7x7 feet, and weighing but seven pounds. I have used it and find it perfect. The Munson sanitary tent is also excellent. Dr. A. M. Holmes, of Denver, deserves the thanks of the profession for his new sanitary tent cottage.

After living for months in the ideal district of Colorado, New Mexico and Arizona, and studying the weather bureau charts at home, the advantages to be derived from this climate by the tuberculous seem to me absolutely convincing. I believe it is imperative that a philanthropic or national reservation with tent colonies should be established in some part of this locality. Recruiting stations could be opened in the great cities and State sanitoria could send selected cases to the Great Western Tent Mecca. Our government spent millions of dollars in Cuba to drive out malaria and yellow fever for the Cubans and it now seems imperative that it should appropriate moneys for a southwestern reservation for the consumptive.

I am very much indebted to excellent papers by Dr. Waxham, of Chicago; Dr. Denison, of Denver; Drs. Gardner and Solly, of Colorado Springs; to the System of Physiological Therapeutics; to the chief of the U. S. Weather Bureau and his staff of the New York office. I am especially grateful for the courtesy, kindness and encouragement shown me while preparing this paper.

*Modified Summary.*—In summing up the advantages to be derived from these places by the consumptive, let me impress upon you a few points:

1. Consumptives with a rapid breaking down of lung tissue should avoid high altitudes. So also should those of neurotic temperaments.

2. Those with especially developed cardiac lesions, with a marked tendency to a disturbance of cardiovascular balance, should avoid high altitudes.

3. Those completing the fifth decade, where the capacity of muscular exertion is considerably limited, should avoid high altitudes, although I have heard of many cases being taken to Colorado, recovering and taking up their life there.

4. Laryngeal cases do better at the low altitudes.

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## HYPNOTISM AND HYSTERIA.*

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In response to the request of several members of the class, I shall devote the hour to an effort to put you in touch with a working knowledge of the subject of Hypnotism, a sort of fantastic phantasmagoria in the minds of the uninitiated. The medical profession is by no means an unit in its professional estimate of this subject, nor is the lay mind any more unanimous. To the great majority of those who accept as a fact the state or condition known as hypnotism, the phenomenon is so associated with the mysterious, the weird and the uncanny as to leave the student mind in a state of utter chaos as to any tangible or material explanation.

There are many who are ignorant from investigative inaction.

It is instinctive with many to fight shy of the unknown and inexplicable, to let some other fellow go first. We hesitate to enter unexplored territory. A third, perhaps, of the masses, and not a few physicians, are arrant sceptics, denying altogether the existence as a genuine phenomenon of hypnotism in any form or degree. To such sceptics it need only be said *circumspici* "look about you." The most positive and convincing proof is easily at hand, and in limitless abundance. Not to have seen a thing is no evidence of its non-existence.

Much of the mystery which breeds this doubt and this instinctive opposition can be eliminated by a proper method of approach in the study of the subject. Similar, if not essentially identical states, are familiar and accepted in the experience of nearly every one, as, for example, in the transient, dazed state of so-called absentmindedness, in sleep-walking, and in sleep-talking, in states of post-epileptic automatism and in hysterical trance. All these are ecstasic states. For the moment or the hour the individual stands outside himself. To admit this, and it would seem a quod erat demonstrandum, is to accept with clearer understanding what follows. In proportion as one is mentally stimulated by a special idea or thought, all other mental activity is repressed or

* Lecture delivered at the New York Polyclinic.

inhibited or paralyzed for the time, the result being a state of preoccupation or slight trance. The dervishes of Arabia, the fakirs and priests of India, the religious disciples of central Japan, and other orientals develop under certain circumstances, states of self-hypnotism in remarkable degree and profundity. The religious trances and ecstacies of the Southern plantation negroes are identical in explanation and character. The soldier who marches into action to the strains of martial music is hypnotized in a way. The friend who suggests to a friend the doing of a certain thing not previously contemplated illustrates the initial border-line between spontaneous volition and suggestion. These, it may be urged, are all states of self-hypnotism or auto-suggestion. What is the difference after all? It seems to me a case of tweedle-dum and tweedle-dee. If the susceptible individual can, within himself, develop these conditions, why should it not be possible from extraneous suggestion? As a matter of fact, I am not sure but that all states of hypnotism are autogenous, the operator or hypnotiseur simply suggesting to the suggestibility of the subject. The argument is equally tenable that all suggestion or hypnotism is extraneous in origin through extrinsic sense impression, as in the effect of martial music on the soldier.

The phenomenon is not limited to man. The lower animals are exceedingly sensitive. I have seen the late Dr. Landon Carter Gray hypnotize at one seance a rabbit, a frog, a pigeon, a lobster, a canary and a man. I have myself hypnotized frogs, birds, dogs and other animals. The familiar child's trick of stretching a chicken's neck out, bringing the bill to a certain crack in the floor or line in the sand, gently stroking the head or body at the time, then leaving the chicken stretched out unrestrained for several minutes, is an example. The snake charming a bird, the man controlling a wild beast with his gaze, are not necessarily myths, to my mind, both allowing of a quasi-rational explanation in hypnotic influence. Mowglie's control of his fellows of the jungle, as described in one of Kipling's recent publications, quite graphically illustrates this power, although the illustration is lacking in scientific value or force.

Another deterrent influence, of no mean weight in its effect in delaying our knowledge of the subject, is the red flag of danger which has been waved along the line of research in this field. "Much harm can be done to the subject:" "his mental integrity may be seriously impaired;" "his will power utterly destroyed and he himself degraded to the purposes, meritricious and even criminal, of the operator." There is no evidence whatever in support of such doctrines, and very much evidence directly to the contrary.

Hypnotism, beyond question, although very limited in its field of usefulness, has accomplished good; that it has done harm, when legitimately employed, remains absolutely without proof in specific instances. There has been much of empirical damnation. As a result of careful investigation, I am convinced that those who cry loudest Wolf! Wolf! know least about it. In this instance, as in many others, fear is born of ignorance. Employed illegitimately and for ulterior purposes, I am not sure but that its results might be harmful. To put morphine in the hands of the quack or layman, or to give children matches to play with, of course involves danger. The layman has no business handling morphine, and he who puts matches into a child's hands invites trouble. Admitting, for arguments sake, that there is any danger, are we therefore to discard it altogether? If so, to be logically consistent, we should, as Hirt suggests, discard ether, chloroform, opium, strychnine, and indeed, practically all our therapeutic resources. In justice to myself I wish just here to discount the possible charge of enthusiastic faddism. I am no enthusiast. I simply want to see fair play. Quite as much harm has been done in delaying and obstructing a calm judicial adjustment of values, by the optimist as by the pessimist. There are hypnotists "run mad" beyond question—men, who, if they are to be believed, can cure anything from a cold to a carbuncle, by hypnotism. Such enthusiasts possibly have hypnotized themselves. This, at least, is a charitable explanation of their utterly visionary and extravagant assertions. "In medias res tuta est." Somewhere between the two extremes of enthusiastic advocacy and materialistic doubt lies an agent undoubtedly entitled to a legitimate, though limited, place in our useful therapeutic resources. The youth of the subject affords another explanation for our ignorance. Hypnotism proper dates back only some 200 years, ab initio. It was first called Mesmerism. Franz Mesmer was born in 1753. He enunciated the doctrine, in explaining certain phenomena induced by him in susceptible subjects, of a magnetic fluid, atmospherically communicable, from operator to subject, which gave to the former complete control over the volition of the latter. He was a gigantic fakir, scientifically at least, but, as in other instances, some good thing may come out of even such a Nazareth as that. We owe something of value to Hahnemann and even to Mrs. Eddy. Hypnotism proper dates from the writings and teachings of Braid in 1841. Liebault, following Braid, reviewed and further elucidated the subject in 1866. To Bernheim's work, published in 1884, less than twenty years ago, however, we owe more than to any other source, a scientific estimate and systematized elaboration of the subject. Charcot, Richer, Haidenhaim, Forel and others have added much to our working knowledge. Much remains to be done, and effort should be encouraged and not repressed.

Coming directly to the subject and to a résumé of our present knowledge, two important factors present themselves for consideration: First, to what extent does hypnotic power exist in the operator, and to what extent does hypnotic susceptibility or sensitiveness occur in the subject? As to the former, I believe with Hirt and others,

that hypnotic power is primarily quite limited. I believe, however, that it can be acquired by cultivation and self-education quite readily. The hypnotiseur must believe first, in hypnotism. He must have a legitimate purpose in view; he must have self-confidence, which is greatest, of course, when born of experience. Sceptics are incompetent, and to them failure is predestined. Bernheim says that the physician who cannot hypnotize 80 per cent. of his material does not understand his business. This I believe to be an extreme view under any circumstances. Properly interpreted it means simply that Bernheim had had much experience. A certain degree of inconstancy in results must remain, for the reason that the personal equation of both hypnotiseur and subject is itself inconstant. As to susceptibility on the part of the subject there is an extreme divergence of opinion as to groups and classes. How much of this is due to the attendant circumstances surrounding operator and subject is hard to determine. For example, Charcot and Richer held that hysterical subjects were easily hypnotized. American authors and many English and German observers disagree with this conclusion. Charcot's experiments were at the Salpetriere, a hotbed of hysteria amidst a nation of hysterics. The Latin races are peculiarly susceptible to hysteria and to hypnotic suggestion. These facts must be taken into consideration. The racial difference should never be overlooked. Dana, Church and others among American authors, state that children are peculiarly sensitive to hypnotic influences. This I believe to be absolutely at variance with the facts and the principles of the whole proposition. It is universally conceded, whether from experience or acquiescence, that idiots, imbeciles and the weak-minded are insusceptible to hypnotic influence,—on a priori ground, children are equally, or, at least, proportionately insusceptible, and, as a matter of fact, so far as personal experience goes, they are exceedingly difficult subjects. The subject is susceptible or sensitive in proportion to his intelligent understanding of and cooperation with the operator's purpose; he must be without fear of the effects; must have confidence in the hypnotiseur, must be capable, by fixing his mental attention, of a cooperative understanding. There should be the most perfect and frank rapport between operator and subject. Absolute cooperation is not essential in the peculiarly susceptible and educated subject, but as a rule, it is necessary. The percentage of people taken at random from the masses, who are susceptible to hypnotism varies widely from 20 per cent. to 80 per cent. It is necessarily an inconstant and widely variable percentage, because of the importance of the personal equation and relation between operator and subject.

The method or technic varies considerably also, although the salient idea or principle is the same always. Braid's method was to exhaust by fatigue the visual sense, the subject being required to look steadily at some bright object (a coin) held a few inches or feet from the eye,—the distance makes no difference, although certain text-books would lead you to believe that six inches is the limit. Luys used revolving mirrors in a darkened room. Richer employed flashlights, Charcot, flashlights or loud sounds on a gong or tomtom. Bernheim employed the fixed gaze, requiring the patient to look him steadily in the eye, he meantime employing suggestion, telling the subject that he was getting sleepy; that he was asleep, that he could not open his eyes, etc. Stroking the head, face, or limbs is often employed as an adjuvant means to the desired end. The employment of monotonous sounds, as the ticking of a watch, or striking of a gong, is at times successful. Hirt's method of utilizing the psycho-physical effects of electrical sensations in obstinate subjects demands special mention as being both ingenious and practical. Dana, I am told, employs a lighted candle in a darkened room. My friend, Prof. Adler of the Smithsonian Institution, called my attention to the technic of self-hypnotism practised by the llamas of India as illustrated in Kipling's "Kim," where the llama could self-induce a state of subconscious trance by practising a certain method of forced inspiration.

The arbitrary divisions of hypnotism into different stages is, I believe, relatively unimportant. Later on it may prove to be of some technically scientific value, but, so far as therapeutically beneficial results are concerned at present, it seems to be immaterial as to whether the patient or subject is in the lethargic, cataleptic or somnambulistic state. Bernheim gives nine stages of varying degrees of hypnotism. His ninth stage is the only one of practical importance, representing as it does, a state of posthypnotic suggestion by which the subject is kept under the influence of the hypnotiseur when personally absent or separated by either time or distance.

What good does hypnotism do? This is the final and all important question. It has been successfully employed for the relief of various neurasthenic and hysterical obsessions; the phobias, functional disturbances of the senses, anesthesiæ, paresthesiæ, hysterical motor pareses, conditions notoriously difficult of relief by other means. The results attained in these fields suggest an almost limitless possibility of extension. Indeed, its importance as a therapeutic resource lies not so much in what has been done, as in what may be done. There seem to be certain quite positive contraindications to its employment. In the delusional insanities and in organic and toxic nervous diseases, its employment suggests not only an insult to intelligence, but an agency pregnant with much evil. The induction of surgical anesthesia for minor operations, the minimizing of labor-pains in parturition are both accomplished results according to the published reports of reputable observers. The regulation of menstruation and the control of constipation by hypnotic suggestion, claimed by Forel, are suggestive as to the

direction in which the field of application may be ultimately further widened.

Having reviewed the general aspects and principles of the subject, let us see to what extent these principles may be illustrated by example. The patient before you has a most interesting history, which briefly summarized is as follows:

X. Y. Z., aged twenty-one years. Electric work. El. R. R. Cough and dizziness and general bad feeling in Oct., 1902. Consulted one of the staff at Roosevelt Clinic, who pronounced symptoms due to goiter. Told operation was necessary, and if not done he could not live long. Operation done November 7. Goiter removed followed by partial aphonia. Second operation done February 10, on other side of neck, to relieve some cosmetic defect from first operation. Both operations under ether. Total aphonia following second operation, which continues and on the day following he was seized with cramps in legs and arms, feet and hands (typical flexor contractions), also in face. These continued daily for twelve days, when he was given drugs hypodermically to relieve. One week later the contractions returned, but in very short paroxysms. Since then short attacks about every week. On March 26 he had a fit of some kind: "black in face, eyes rolled back, muscles became rigid, unconscious for half an hour or more." Ever since the twelfth day after last operation has had numbness of second finger of left hand, limited sharply at metacarpal joint. Also similar sensation but more peculiar in distal phalanx palmar surface, right thumb, absolute joint limitation also. About sixteenth day after operation, developed area of exquisite painful sensitiveness about size of silver dollar on anterior thigh, left leg, about 1½ inches above the knee. Some swelling apparently, but no fluctuation, redness, etc., and in three days had disappeared, leaving no sign, no recurrence. Has had frequent feeling as of choking, lump in the throat. At times much depressed, and has "spells of breaking down," cries and is very nervous, feels as if he "didn't care for anything," and wants to die. Often lies awake two or three hours on retiring, and often sees visions floating about the room, lights, machinery at work, etc. Several varieties of visual hallucinations, but always knows it is his imagination. Can drink water, milk, ginger ale, and, indeed, anything but tea and coffee, either of which chokes him. Has found a spot just above clavicle and to the left which if touched makes him cough. Concentric limitation of visual fields. The diagnosis of postoperative major hysteria is quite obvious.

He was referred to me by Dr. Dougherty, of Dr. Quinlan's staff. The case seemed to me to be one peculiarly likely to be benefited by hypnotic suggestion. I found the patient an exquisitely sensitive subject, passing readily into the somnambulistic state at the first seance. In this case as in all others, I employed the same procedure. I first explained to the patient what I intended to do, assured him as to the absolute absence of danger or discomfort, and asked his intelligent cooperation. I employed as usual the Braid method. I made no suggestion whatever during the first seance. I try to get first the absolute confidence of the subject. The second time I hypnotized this patient I suggested to him that he would find the left thumb much improved as to the anesthesia; the third time I suggested complete disappearance of the thumb anesthesia, and a diminution of the trouble with the second finger of the other hand. To-day I shall try to get rid of these sensory disturbances altogether. He tells you that the thumb is now all right and the second finger much better. I shall next take his aphonia and gradually, one at a time, shall rid him, I think, of most of his ills. I place him in a comfortable position for a nap. I hold this ophthalmoscopic lens before him thus, three or four feet away, and tell him to look steadily at it, and to go to sleep, that his eyelids are getting heavy, that they are closed, that he cannot open them, that he is asleep. You see him, gentlemen, fast asleep, apparently, at least. I take his hands, put them into various arbitrary positions, tell him he cannot change these positions, and leave him so. Stroking the thumb and finger, I tell him he will find them in a normal state when he wakes up. I leave him in this state of cataleptic sleep or trance for two, five or ten minutes, then touch him and tell him, "That is all," and he returns to consciousness. The patient tells you he was asleep, and yet it was a different kind of sleep: that he heard my voice, but nothing else, and that he felt that he had to do whatever I said, etc.

*Note.*—I subsequently exhibited this patient before the West End Medical Society, New York City, perfectly well in every respect. Six seances occurred altogether.

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## DRY SUPERHEATED AIR IN THE TREATMENT OF SEPTIC INFECTION.*

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ONE of the most dreaded of the pathological states which we encounter with a moderate degree of frequency to-day is septic infection. It is also one of those conditions, which, when fully developed, offers very meager prospects for successful management under ordinary methods of treatment. About the only effective management has been to prevent the accident from occurring, and honor will never cease to be paid to Sir Joseph Lister and those who have followed him in developing the technic of antisepsis and asepsis to the wonderful degree of thoroughness and efficiency, which to-day enables our surgical con-

* Read before the Clinical Society of the New York School of Physical Therapeutics.

freres to accomplish curative feats that would have been characterized as nothing short of absolute magic by the practitioner of fifty years ago.

When septic infection has once gained a foothold in the human system, however, neither antisepsis nor anything else has offered us much in the way of power to extinguish the conflagration, and we have had to go back to the first principles of therapeusis, merely keeping the patient's general condition as good as possible, and hoping that his constitutional vitality would enable him to overcome the invasion. Sometimes when the infection is confined to a limb we can cure the patient by amputating the infected member, and although this is a most distressing alternative for the patient, yet it is better than death, and he will usually consent. But in how large a proportion of cases do we see the infection reappear in the stump two or three days after the operation, to impress us anew with a realization of our helplessness in the presence of well-established septic infection? Therefore, any remedial measure which promises to be helpful in the battle with so intractable a condition as this, deserves consideration and study, and dry hot air promises to exhibit this power in an eminent degree.

When a new therapeutical agent is brought to our attention the first question that naturally arises is "What will it do?" and in considering the therapeutical application of dry hot air with reference to septic infection we find it convenient to divide the cases into three classes: (1) Those in which the infection has taken place in a limb and has not yet invaded the lymphatics of the joint connecting the member with the trunk, and which are nearly always early cases: (2) those in which the lymphatics of the trunk have also become involved, but where the original focus of infection has not yet become so profoundly effected as to demand removal: and (3) those in which the lymphatics of the trunk are involved and the tissues originally invaded are so hopelessly diseased as to demand immediate operative interference. The two last-mentioned classes nearly always exhibit a profound systemic toxemia, as will also an occasional case belonging in the first-mentioned category.

Among thermotherapists the beneficial influence of dry hot air upon the progress of cases belonging in the first-mentioned class of infections is so well established as only to need a mention in order to be appreciated, but as the vast majority of you are not thermotherapists, and as very few of you are at all familiar with the agent in any of its therapeutical or clinical aspects, I will cite briefly the following case, as illustrative of its power in this situation.

*Case.*—Mrs. F. D. K., twenty-four years old, punctured the middle finger of her right hand with a fork April 16, 1901. The wound showed evidences of infection the next day which rapidly increased, involving the hand and wrist until April 19, upon which day she consulted me about the matter. At this time, the finger, hand and wrist were badly swollen. Red streaks ran up the forearm nearly to the elbow and the lymphatics of the elbow were palpably enlarged. Constant and severe pain was present in the arm throughout its extent. She had not slept for thirty-six hours. Pulse 100 per minute, temperature 103° F. She was given a local hot-air treatment which included the hand, forearm, and up to a point two inches above the elbow, at 400° F. for an hour. The pain was entirely relieved during the treatment and she was told to report again in the evening for another application, which she did. At this time there was no apparent change in the local condition. No extension of the process had taken place, neither was there any evident diminution in the areas involved. The relief from pain due to the first treatment lasted five hours. At this time it was again quite severe. She was given another local application of the same character as the first which again relieved the pain completely. She was directed to come on the following morning for another seance.

She appeared according to appointment. She had slept nearly all night, the swelling had decreased 50 per cent., redness had disappeared everywhere except in the immediate vicinity of the original injury, and the enlargement of the glands at the elbow had decreased in a marked degree. The member was painful only on movement and manipulation. Pulse was 80 per minute. Temperature 99.5° F. She received eight treatments during the next five days. The pain did not return after the treatment on the morning of April 20. The swelling of the hand and forearm and the enlargement of the glands at the elbow decreased steadily and rapidly and on April 25, or six days after the first hot air treatment, she was discharged without a trace of the trouble remaining.

In cases of the second class the therapeutic problem becomes considerably more complicated, but the clinical phenomena are scarcely less striking, and the following case exemplifies very well the results usually obtainable here.

*Case.*—Mr. G. P. H., thirty-two years old, was brought to the sanitarium March 2, 1901, by Dr. A. S. Cheney of New Haven. Four days previously he had cut his hand with a dirty jack-knife. The usual evidences of infection duly appeared, and when he entered he was in a condition of profound prostration with a temperature of 103.4° F.; respiration 28, but the pulse was only 86. Hand and arm were considerably swollen. Lymphatic glands about the elbow and in the axilla were irregularly enlarged, those in the latter situation to about the size apparently of an English walnut. He was in constant severe pain. The presence of deeply located suppuration seemed probable but was not positively demonstrable. He had been brought in with the intention of operating the next day. It was finally decided, however, to treat him with hot air first, holding operative interference in reserve.

At noon of the day following his admission he was given a body hot-air treatment at 340° F. Perspiration was profuse, the pain was relieved

entirely before the conclusion of the treatment, and he had a quiet, refreshing sleep after he had been removed to his bed. The evening temperature was 102.5° F. as against 103.4° F. of the previous day.

Next morning at 8 o'clock his temperature was 99.9° F. and pulse 84. The patient had slept several hours during the night. The pain had not returned to any great degree, and the prostration and nervous symptoms were greatly lessened. The swelling in the hand and arm was less, as was also the enlargement of the glands in the axilla. He was given another body treatment at noon at 350° F. His temperature was 101.8° F., pulse 80, as against 102.5° F. and 94 respectively the preceding evening.

Treatment was administered again late in the afternoon. Morning temperature the next day was 99° F., pulse 78. Patient had slept at intervals during the night and during the day, resting quietly. That evening his temperature was 100.4° F., pulse 76. Pain and swelling had entirely gone out of the arm but the axillary enlargement persisted as did also a considerable amount of pain in this region.

The following day, March 7, his morning temperature was 99.4° F., pulse 76. In the afternoon he was given a body hot-air treatment at 350° F. and the next day his temperature in the morning was 99° F., pulse 70. In the evening the temperature rose to 100.6° F., with the pulse averaging 88.

At this time palpation of the axillary enlargement demonstrated the presence of pus and it was decided to open the axilla the next day, which was done at four o'clock in the afternoon, Dr. Cheney operating. Upon incision, a large quantity of fluid pus was evacuated and a pocket was discovered running up under the clavicle for a distance of about three inches, of a diameter sufficient to admit of exploration with the forefinger. This cavity was lined with an enormously thickened pyogenic membrane, and *no glands outside of it were involved in the infective process.* It will be observed that this is a very different picture from that usually encountered under these conditions, where the contents of the abscess cavity consist of pus with a plentiful admixture of cheesy detritus which it is not at all easy to remove in a thorough manner, and where gland after gland is found to be infected, necessitating a vast amount of dissection in order that the extirpation shall be complete.

The pyogenic membrane was curetted out and the subsequent progress of the case toward recovery was rapid, satisfactory, and uneventful. On March 13, the body temperature returned permanently to the normal point and he was discharged on March 23, just three weeks after his admission, entirely recovered from an attack of septic infection which was very evidently seriously threatening his life when he entered.

This case illustrates the necessity of combining operative interference with dry hot-air treatments in those cases where such structures as lymphatic glands have become diseased to such an extent that disintegration is inevitable and pus accumulations are present. The immediate improvement in the patient's general condition after the first hot-air treatment together with the strenuous localization of the inflammatory process in the axilla, illustrate the powerful influence of body hot-air treatments in lessening general systemic toxemia, and in preventing the spread of the infection from structure to structure through its power of increasing the constitutional resistance of the cells composing the threatened areas.

The shocking railroad accident, which occurred in the Park Avenue railroad tunnel about a year ago, furnished an illustration upon the person of one of the victims, of what thermotherapy can do in infections belonging in the third category.

*Case.*—Mr. A. W. A., aged fifty-one years, was admitted to the New York Hospital on the morning of Jan. 8, 1902, with a traumatic amputation of the left foot at the ankle. The crushed member was attached to the leg merely by the lacerated posterior tendons. Patient of course was suffering considerably from shock. Amputation of the lower third of the leg was done by Dr. Francis Marcoe that afternoon. Septic infection, however, declared itself three days after the injury. On January 12 it was noticed that the knee was swollen; on January 15 pus began to discharge from the wound, and in spite of the utmost care the condition increased in gravity until January 23, fifteen days after the original injury. At this time the leg up to the knee and somewhat above this joint was enormously swollen, the tissues of the stump were sloughing in places and the patient's general condition was one of extreme prostration. In short, he presented a typical picture of the severest form of blood-poisoning, except that streptococci had not been found in the blood.

It was decided to amputate the infected member above the knee as a forlorn hope. This was done by Dr. Frank Hartley on the evening of January 23, at the middle of the thigh. He rallied very well from the operation and the next morning was given a body hot-air treatment. During the time intervening between January 24, the day of the second operation, and March 8, the day of his discharge from the hospital, the patient received 13 body treatments, the greater number of which, of course, were given during the two weeks immediately succeeding the amputation of the thigh. His general condition began to show slight evidences of benefit at once in the way of increased comfort, ability to sleep, and improvement in the vital signs, and he continued to gain slowly but steadily, until by February 5 his improvement had become so manifest as to justify a prognosis of recovery with a moderate degree of certainty. From this date on, his improvement was entirely satisfactory, and to-day his general condition is better than it has ever been in his life before, and he weighs as much

within one pound without his leg as he ever did with it.

In order to indicate the gravity of the case I will say here that it was the unanimous opinion of the physicians who saw him that neither the operation nor any ordinary therapeutical measure would save the patient's life. The fact also that slight evidences of tissue disintegration appeared in the wound three days after the second operation, is indicative of the fact that the operation and therapeutical measures other than hot air would not have sufficed to secure a successful termination.

Now, as it has been objected that the beneficial results of hot-air therapy are coincidental and not due to powers inherent in the agent itself, I will say here that this might constitute a plausible theory if those results had been observed in only a few cases, but when they are noted in case after case the conviction finally becomes inevitable that the remedy is the responsible factor, and such has been the course of events in connection with the remedy under consideration.

As far as I know hot air has not been used in a case of septic infection in which streptococci have been found in the blood, but its physiological action indicates that it will be of great assistance in even this ordinarily hopeless condition. Cases of puerperal sepsis have also not as yet been subjected to its influence. There is apparently no reason why we should not be able to get good results in this condition.

The cases recently reported by Dr. Barrows, of New York City, in which streptococci were found in the blood and which recovered under the use of intravenous injections of formalin, suggest most attractive possibilities in the treatment of this grave form of sepsis for the future, and it is most sincerely to be hoped that future experience with the intravenous injections of formalin will justify the expectations which have been raised by these cases.

So much for clinical results. The next question presenting itself for consideration would be "How does the agent produce these effects? What is the physiological modus operandi of the influence which has been observed?" To answer this query, we shall have first to ascertain the physiological action of treatments with dry superheated air, and then to consider the pathology of septic infection with reference thereto.

It will be observed that two varieties of hot-air applications were employed in the cases just cited; one where only the part affected was treated and which is denominated the "local treatment," and the other where the greater portion of the body surface was subjected to influence, and which is denominated the "general" or "body treatment." Although the physiological actions of these applications differ from each other chiefly, as far as septic infection is concerned, in degree rather than in kind, yet we shall find it instructive to consider them separately in connection with the cases just cited, and will give our attention first to the local treatment.

This therapeutical measure affects physiological function in two ways; first, by a direct stimulation of cell metabolism in the part treated due to the raising of its temperature en masse; and second by a reflex acceleration of cell nutrition set up by the stimulating influence of the heat upon the numerous nerve endings in the skin.

It is, of course, not possible to raise the temperature en masse of one portion of the body very much higher than that of another portion, but by placing the bulb of a clinical thermometer at the bottom of a deep sinus and then applying a hot-air treatment, it has been demonstrated that an increase of several degrees Fahrenheit can be induced. This is enough to accelerate oxidation processes very perceptibly, and also to inhibit appreciably the development of most of the common pathogenic micro-organisms.

It has been suggested that the germs in these cases were directly *destroyed* by the heat. This view, however, is improbable, and there is no experimental or clinical evidence available indicating that it is possible to raise the temperature of any portion of the body sufficiently high to produce this result.

Through the reflex influence is obtained an emphatic local hyperemia, which, together with the stimulation of the trophic nerve supply of the part treated, results in greatly increased local nutrition, whereby the vigor of the normal cell resistance to germ invasion is accentuated.

Copious perspiration appears upon the region treated, and in greater or less degree upon the rest of the body, whereby the general circulation is relieved from a certain proportion of the toxin which is impregnating the body fluids.

To the influence upon the circulatory function of the part whereby stasis is relieved, is probably due the powerful influence of dry hot-air treatments in relieving pain and swelling.

The physiological action of the body treatment is predominantly reflex through the spinal sympathetic, the area of skin affected being so great that the capillary circulation is able to dissipate the heat before it penetrates deeply enough to exert its action directly to any great extent, therein differing from the local application.

Microscopical and chemical examinations have demonstrated that the following phenomena are susceptible of immediate induction by the body hot-air treatment. (1) If hyperleucocytosis is not already present the number of white blood corpuscles is increased in different cases from 15 to 50 per cent. If it *is* present, the increase is usually not so great, or it may be entirely nil. (2) The red blood cells are increased from 10 to 20 per cent. (3) The quantity of urine passed in the twenty-four hours succeeding the treatment is usually increased from 25 to 100 per cent. over the quantity passed in the twenty-four hours preceding. In a few instances, however, a decrease in the quantity has been observed. (4) The quantity of urea excreted in the twenty-four hours succeeding the treatment is increased from

15 to 60 per cent. over that excreted in the twenty-four hours previous. These effects persist, with decreasing intensity, for from four to forty-eight hours and sometimes longer.

The general phenomena induced by the body application are as follow: The mouth temperature rises from 1 to 5° F., according to the length and intensity of the application, and the susceptibility to stimulation of the individual patient's deep nerve centers. The pulse is accelerated from 30 to 50 beats per minute and is markedly increased in volume. If it was weak before treatment it now becomes strong. If the application is continued too long it loses its volume and strength, becoming rapid, small and soft. The respiration deepens and the rate increases 5 to 10 cycles per minute, but this modification is not accompanied by any oppression—rather the reverse, in fact. The capillary areas become injected, but this phenomenon is not so marked in the regions actually in contact with the heat as with the local treatment. The fact that the capillaries of the face, which is not subjected to the heat, share this general distention even when constantly under the influence of the breeze from an electric fan, demonstrates the profundity of the reflex obtained. The patient reeks with perspiration, the acidity of which is markedly increased over that normally exhibited.

By this profound stimulation of the deep trophic centers we secure first, a more rapid and complete oxidation of effete materials which are clogging metabolic processes, figuratively speaking, into normal excretory products—urea for the kidneys, $CO_2$ for the lungs etc.,—which are then easily disposed of by the appropriate organs: and second, a rapid production of more vigorous and healthier cell elements which are much better able than their predecessors to resist toxemia and microbic invasion. Such being the physiological effect upon the human organism of dry hot-air applications, let us glance for a moment at the pathological conditions obtaining in septic infection, and see whether or not they are such as would logically indicate the induction of these influences. The primary etiological factor consists of the lodgment in the lymph spaces of pathogenic micro-organisms. After this event has occurred, one of two things will happen: (1) What we will denominate the patient's constitutional resistive power, may be intense enough to enable the cells composing the invaded tissue to destroy the infective organisms, in which case nothing further will be heard from them. (2) The patient's normal constitutional vitality may be lowered from some cause, or the resisting power of the tissues attacked may be weakened, as by impairment of the trophic nervous control from injury or shock, for instance, in which contingency the invading organisms find a pabulum suitable for their development, and they multiply with exceeding rapidity, spreading colony after colony into the numerous ramifications of the lymphatic system, until finally millions of noxious toxin producers are vomiting their paralyzing venom upon structures whose trophic processes are more and more overwhelmed until beyond the possibility of spontaneous redemption, thus rendering larger and larger areas of tissue a favorable soil for their further propagation. These poisonous emanations, together with the ptomains, resulting from tissue disintegration, are taken up by the general blood circulation and brought into contact thereby with all the nerve centers and other tissues of the body, whence results the evil clinical picture so harassingly familiar to most of us, as "blood poisoning."

Two important points to be borne in mind in this connection are, first, that when the normal resisting power of a tissue is unimpaired it is probable that it is capable of overcoming any ordinary microbic invasion: and second, that most of the common pathogenic germs require for their propagation that the conditions most favorable to their development as regards the temperature of their environment, etc., be maintained with a moderate degree of uniformity. These conditions exist very nearly to the point of perfection in the living tissues of the human body, and any influence which alters them to any extent would tend to inhibit the growth of the germs in proportion as the alteration was profound. Now, when a local hot-air application is made to a part exhibiting the evidences of septic infection, what is the sequence of events inaugurated thereby? (1) the reflex stimulation of the vaso-motor tracts through thermic irritation of the nerve endings in the skin, relieves the fluid stasis in the part, thereby lessening the pain: (2) the nutrition and cell vitality of the part are augmented by reflex stimulation of the trophic nerve supply through the same channels: (3) the raising of the temperature of the part, en masse, disturbs one of the most important conditions, which it is essential should be maintained unimpaired, if the propagation of the micro-organisms is to reach its fullest development: (as we have seen the living tissues of the human body, when exempt from modifying influences, constitute an ideal culture medium): and (4) the integumental emunctories are stimulated to greatly increased functionation. Now the lessening of the pain quiets the patient's nervous system in direct proportion as the relief is complete, thereby conserving his nervous energy, and the relief of stasis insures a plentiful supply of raw material in the form of an augmented blood circulation, out of which new cells may be built up to take the place of the exhausted, worn-out elements; the augmented trophic impulses result in advantage being taken of this increased supply of raw material for the rapid formation of cells possessing a heightened vitality, whereby the resisting power of the tissue is at once greatly increased: the raising of the temperature of the part, en masse, exercises an inhibitory influence upon the development of the colonies of micro-organisms whereby the virulence and quantity of the toxins emanating therefrom are reduced in direct proportion as the inhibition is profound; and the

enormously increased functionation of the sweat glands removes directly, from the parts most profoundly influenced by the intoxication, a certain proportion of the noxious substances which had previously been devitalizing fresh areas of tissue and passing into the general circulation. What is the result? Instead of the destructive process spreading farther and farther into the sound tissues, we find that the cells at the periphery of the infection, which were just beginning to feel the debilitating influences of the approaching destruction, are regenerated and carry on their reconstructive functions with a normal, or perhaps even an abnormal, degree of activity and efficiency, pushing the lines of healthy tissue farther and farther into the diseased areas, until finally the pathological mass is entirely replaced by healthy tissue and the patient has recovered, frequently *without even a slough*. When a collection of pus is present, however, it is necessary that it be evacuated, neither hot air nor any other measure with which I am acquainted being capable of producing absorption. But even when pus is present hot air will strenuously localize the inflammatory action very closely to the abscess cavity, when a stroke of the knife will end the trouble once and forever.

I wish to refer here, briefly, to statements which I have seen that local hot-air applications to localized infections of any sort were dangerous, and very likely to transform a local into a general pathological condition. I have never heard a logical defense of this statement, and I have never heard of an authentic case where there was any satisfactory evidence that such a result was properly attributable to hot air. Further, in the many thousands of such treatments which I have administered myself, and have had administered under my supervision to such cases, I have never, in a single instance, seen the slightest reason to consider that hot air had been guilty of precipitating such a disaster, and I am free to state my entire disbelief in the existence of any cause for apprehension in this respect.

With cases belonging in the second and third categories, the physiological effect of the local treatment will not usually be sufficient to produce a cure, because in these cases foci of infection have appeared in parts so situated that the maximum influence of the local treatment cannot be brought to bear directly upon them. Under these conditions it becomes necessary to call up all our patient's reserve forces, to stir his vital resistance against the invading organisms to its profoundest depths, and the body hot-air treatment enters the therapeutical problem.

With this application we cannot invoke the directly inhibitive influence upon germ development due to the raising of the temperature of the part, that is obtainable with the local treatment. As we have seen when considering the physiological action of the body treatment, the normal mouth temperature is rarely increased beyond 3° F.; this is not enough to appreciably retard the growth of the streptococcus. Indeed, patients very frequently exhibit elevation of temperature to this extent when they enter the apparatus. The greater beneficial power of the body treatment consists in, first, the greater proportion of systemic toxemia which is eliminated through the increased functionation of the skin, kidneys, and lungs, whereby the vital processes are more efficiently relieved of impairment and depression; and second, its gratifying influence in stimulating to renewed vigor of function the deep spinal and sympathetic nerve centers that control tissue reconstruction, and which have been overwhelmed to a greater or less extent by toxin accumulation in the general circulation.

Usually the first indication that the former has taken place, is a lessening of the nervous erythism which becomes manifest immediately after, and sometimes before the conclusion of the first treatment, when the patient frequently falls into a refreshing sleep lasting from one to several hours.

The augmented functional vigor of the deep spinal sympathetic nerve centers is evidenced before the patient leaves the apparatus by the improved character of the pulse, and within twenty-four hours usually, the reinvigoration of the trophic functions is manifested by a marked lessening and sharp localization of the local inflammatory phenomena.

Lack of time forbids my entering largely into the subject of technic, but I wish to say just a word in reference thereto, as the difference between a skilful, thorough application of the agent and the reverse, will not infrequently constitute the difference between success and failure in clinical results. The most prevalent error in the popular conception of the modus operandi of the curative power of hot air, is that it produces its effect merely through the induction of integumental hyperemia, and toxin elimination as represented by the induction of profuse perspiration. This has led to applying the agent at temperatures only sufficiently high to produce sweating, that is from 200° F. to 250° F. By this means elimination has been secured, and very effective elimination, too, but that is all. Now to obtain the best and the permanent curative influences of dry hot air, we must not only induce elimination, but we must also supplement and perpetuate as far as possible the advantage dependent thereon, by augmenting the trophic reconstructive functions whereby we increase the patient's constitutional resistance, and effective stimulation of these processes is not possible unless the higher temperatures, from 300° to 400° F. are used.

One more important point in connection with the technic of the body treatment is that no hard and fast rule as regards the duration of the application or the intensity of the heat employed can be laid down to govern all cases. The susceptibility to thermic stimulation of the nerve centers of different individuals varies greatly, and each must be treated according to the physiological phenomena induced in his particular case at each treatment. Overstimulation is not difficult of induction with many patients, and this

would be nearly if not quite as bad as an inefficient application. In non-febrile cases, and those exhibiting only a low degree of febrile action, it is usually an indication that sufficient influence has been induced when the mouth temperature has been increased 2° F. above the normal, or when the pulse has been accelerated to 120 or 130 beats per minute. In septic infection, however, an abnormally high body temperature and an accelerated pulse-rate usually obtain when the patient enters the apparatus, hence these modifications of the vital phenomena cannot be entirely relied upon here as guides to treatment duration and intensity. The general effect upon the system at large must be consulted, and the instinct which is the result of experience is invaluable. As a rule, however, it may be said that the pulse should not be accelerated beyond 140 beats per minute, and that nausea, giddiness, faintness and other evidences of overstimulation should be carefully avoided.

The third and last phase of the subject which we will consider, relates to the employment of other therapeutical measures in conjunction with hot air. Can better clinical results be obtained by combining other things with this agent than by relying upon it alone? The question may be unhesitatingly answered in the affirmative, and in some diseases other than the one under consideration, very emphatically in the affirmative. In septic infection, however, the other measures which will enter the therapeutical problem are few, and consist chiefly in judicious regulation of the diet, proper regulation of the excretory function of the bowels, preferably by calomel and salines, appropriate surgical dressings where there is an open wound, and the early evacuation of pus and removal of sloughing tissues wherever and whenever they are in evidence. Pain relieving drugs and stimulants will very rarely be required when skilfully applied hot-air treatments are obtainable. Sometimes open surfaces will exhibit sluggish reparative action and refuse to heal, and here the application of the negative pole of the galvanic battery, employing a bare metal electrode and three to five milliampères of current will render most excellent service. Care must be exercised not to use enough current to cauterize, however; the beneficial influence is obtained through electrolytic not destructive action, and the induction of the latter will sometimes retard the curative process. Aside from this, electricity will rarely need to be considered in this affection, when hot air is obtainable.

In conclusion, permit me to say that, although dry hot air in the treatment of septic infection is a "good thing," yet it is not invariably a "dead sure thing." Side-lights, in the form of individual idiosyncrasy on the part of the patient, or variations in the inherent malignancy of different instances of even the same types of infection, will sometimes flash across the scene with an intensity sufficient to embarrass most seriously the exercise of a satisfactory influence on the part of any curative agent. It will alone and unaided, cure many cases; others will require all the remedial resources at our command; and in still others all that we have will not suffice to produce a cure. It is simply a rational curative measure exhibiting a known and constant physiological action, and which, either alone or in combination with other agents manifests the capacity to increase vastly our power to overcome this condition in the majority of cases. It is, therefore, entitled to a prominent position in our armamentarium.

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## THE SANATORIUM TREATMENT OF TUBERCULOSIS.

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(Concluded from Page 19.)

In describing more specifically the treatment of the individual patient in the institution, as will naturally be inferred, I have chief reference to the methods as employed at the Loomis Sanatorium.

The first procedure necessary upon the admission of a patient is to ascertain, with as much accuracy as possible, his exact condition, not only with reference to the respiratory organs but to the constitutional status in general. For this purpose the patient is placed in the infirmary, and, unless otherwise indicated, in bed. In taking the history and making the examination it has proved most satisfactory to follow a definite plan of arranging and charting the data with as much regularity of system as is consistent with freedom of questioning. I have here the charts of two hypothetical cases which will illustrate better than I can describe it, the order of procedure at the Loomis Sanatorium. Part I is a general summary and cannot be completely filled out until the patient is discharged: it serves to enable one at a glance to gather all important facts with regard to the individual case and from which the annual reports may be most conveniently made up. Part II contains the family and personal history. In this connection it has proved of inestimable advantage to go very fully into the past life, habits and environment of the patient in order to lay out more appropriately the special course to be followed in the given case, besides greatly facilitating future individualization of treatment. Part III goes a little more explicitly into the history of the present illness with the symptomatology below. I would call your attention here chiefly to the subjects: "History of Infection," "First Presumable Evidence of Disease" and "First Demonstrable Evidence of Disease." The careful following out of which has often thrown unexpected and valuable light upon a case.

Part IV contains the first and most important results of physical examination and as you can see is, so far as the chest is concerned, recorded graphically.

Part V is a continuation of physical examination.

Part VI is the temperature, pulse and respiration chart, and gives an eight weeks' record for each chart. Temperature, which is such an important guide in tuberculosis, is taken in the mouth, axilla and rectum until discrepancies can be satisfactorily eliminated, after which mouth temperature alone suffices until some change in régime is prescribed as, for instance, increased exercise, when for a few days rectal temperature is taken as a control.

Part VII serves to record the weights and sputum examinations during residence. In this connection I may say that patients are weighed every fortnight only, always before the mid-day meal and always by net weight.

Part VIII the urinalysis and blood examinations.

Part IX is left blank for recording monthly synopses of treatment and régime employed and the noting of phenomena in a case not provided for in the foregoing sheets.

It often becomes necessary to make a more or less exhaustive examination of the stomach in certain types of tuberculous patients, and the form for such, as you see it attached to these hypothetical histories, is taken from that employed at the University of Michigan Hospital by Prof. Dock.

By means of these charts a very full and clear contemporary history of the case is constantly available upon which to base treatment from time to time and finally from which to draw accurate statistics. From these data gained upon admission the case is classified according to the condition found. Various nomenclatures and methods of classification are employed in different sanatoria; probably Dr. Trudeau's plan is simplest and most commonly used. He divides his cases into incipient, moderately advanced and far advanced. For purposes of future study, however, and with the hope of avoiding some of the pitfalls of statistics I have adopted a little more explicit classification at the Loomis Sanatorium. Like Dr. Trudeau and others, I make three divisions but subdivide each group, thus making six instead of three classes into which a given case may be placed as follows:

Early { mild symptoms / acute symptoms

Advanced { with favorable symptoms / with unfavorable symptoms

Long Standing { fibrosis predominating / ulceration predominating

Upon admission to the sanatorium the patient is at once supplied with the proper receptacle for expectoration and a small printed folder embodying general information and the rules governing patients in the institution. These are worded in the simplest and most intelligible manner; but to guard against misinterpretation or carelessness the head nurse goes over salient points with the patient.

The sputum cup used in the infirmary, or during the period of rest is one, the receiver of which is made of paper and can be burned. Later on, when the patient becomes an ambulant case, a pocket flask is much to be preferred for obvious reasons, and for this purpose I prefer the modification of the Detweiller flask the modification consisting merely in substituting an aluminum for a glass body. These flasks are cleansed and sterilized by a nurse each day in a manner effective and safe, the details of which are unnecessary to consider.

The patient is detained at the infirmary then, until his condition warrants removal to a room in one of the cottages. This is ordinarily a matter of but a day or two. He is still kept however under close supervision, and takes no other exercise than is occasioned by coming to his meals three times daily, extra diets being supplied him at his cottage. If he is much below weight, this life of enforced rest must be kept up until his weight approaches the normal average, unless his gain is unduly rapid, in which case mild exercise is prescribed but always under the most rigid supervision. During this period of enforced rest, which is invariably maintained for the first few weeks of his residence, the patient occupies a reclining chair on the veranda sheltered from the severities of the weather, clad and wrapped with a view to his comfort and, of course, according to the season of the year, for from six to ten hours a day. At night he sleeps with windows wide open and in winter between flannel blankets. Half an hour before he rises in the morning an attendant closes the windows and the room is sufficiently warm to permit of comfortable bathing and dressing. During the early part of this rest period his digestive system receives the attention which it usually demands. Mild purgation is ordinarily required following which a light diet for a few days generally serves to prepare the stomach for the increased work which is to follow. As a routine practice this is very essential.

He is at this time permitted to read, play chess or checkers, or by other means to occupy his mind, provided pulse and temperature be not accelerated thereby. For the purpose of using his arms conveniently in the cold weather and at the same time to secure sufficient protection while at rest there are many devices in the way of specially adapted wraps, sleeping bags and the like. I have tried various of them but the modified steamer-rug (devised and manufactured by the Kenwood Rug Co., of Albany) has given the greatest satisfaction, as it is made with a detachable hood and of a specially prepared wool which, without being in the least cumbersome, I have found to be sufficiently warm for the coldest weather, and very convenient for the purposes desired. This article has the additional advantage of being considerably less expensive than most such special devices.

At the end of a period varying from a fortnight to a number of months, according to circumstances, the patient is ready to be placed

upon exercise. This period is determined by the condition of the pulse, temperature and weight. An average pulse rate of 100 or more while the patient is at rest would contraindicate exercise, as would a morning temperature (per rectum) above 99° F. or an afternoon rise exceeding 100° F. While a failure to increase a remarkably subnormal weight would also be a contraindication.

The first exercise should be prescribed with caution and treated as an experiment. It should consist ordinarily of a measured walk on a level and should not exceed a few hundred yards. If this be found not to excite temperature or materially increase rate of respiration, it may in a few days be extended gradually. Mild calisthenics may then profitably be introduced, limited to those exercises which tend to develop the mobility of the chest. I prefer the three sets of simple movements recommended by Knopf[6] which seem to answer the purpose very well. After this, may come hill-climbing, but always with the utmost caution at first. On the sanatorium grounds should be a series of graded paths of known incline with rest stations at frequent intervals so, that this exercise may at first, at least, be prescribed with exactness. Gradually as the disease approaches arrest and rational symptoms disappear, the close personal vigilance may be relaxed but there should never come a time during the course of his residence in the sanatorium when the patient is without that watchful medical supervision which is the keynote of sanatorium treatment.

He may now extend his exercise considerably with advantage and in those sanatoria which are intended for the benefit of the working classes, this exercise may be diverted into useful and profitable lines. For instance at the Loomis Sanatorium Annex, late last fall, I introduced the plan of giving suitable cases among the male patients the opportunity to do light work on the sanatorium farm under the direction of a skilled farmer. They were carefully watched during the experiment, and while the time was too short to allow of any conclusions being drawn, none but good results followed. We shall repeat the experiment during the next summer and if successful it will be suggestive of a plan to make the consumptive convalescent of the poorer class self-supporting during treatment.

Another experiment with regard to the value of increased exercise in convalescents from phthisis was carried out at the Sanatorium Annex during the autumn. Twenty patients all with quiescent lesions, without rise in temperature and up to, or a little above, normal weight, were selected and divided into two classes of ten patients each, known as "Class A" and "Class B" respectively. In "Class A" there were five men and five women (one more male patient entered this class, but together with two others was obliged to leave the sanatorium before the completion of the experiment).

In Class B there were six men and four women. The experiment consisted in placing Class A on greatly increased exercise (hill climbing) for a period of two weeks, during which time Class B was upon a régime of enforced rest. The following two weeks the conditions were exactly reversed. Class B taking the increased exercise and Class A the enforced rest.

Observations were made of pulse and temperature for one week prior to the test, during the test and for a week following the test. Changes in weight were recorded under the various conditions as were the effects produced upon cough and expectoration.

Following are the tables showing in detail the records of the two classes and the summary:

CLASS A.—PERIOD OF INCREASED EXERCISE.

| Case | Period of observation 1902 | Weekly Average T. and P. | | | | | | Weight after test | |
|---|---|---|---|---|---|---|---|---|---|
| | | Previous to test | | During test | | After test | | gain lbs. | loss lbs. |
| | | T. | P. | T. | P. | T. | P. | | |
| 1 | Oct. 16-30 | 98.7 | 84 | 98.1 | 95 | 98. | 81 | 1⅜ | .... |
| 2 | Oct. 16-30 | 98.4 | 98 | 98.2 | 84 | 97.9 | 80 | 4⅛ | .... |
| 3 | Oct. 16-30 | 99. | 101 | 98.6 | 91 | 98.3 | 84 | 1½ | .... |
| 4 | Oct. 16-30 | 98.5 | 100 | 98.4 | 98 | 98.9 | 90 | .... | 1½ |
| 5 | Oct. 16-30 | 97.9 | 88 | 98.4 | 94 | 98.3 | 94 | 1¾ | .... |
| 6 | Oct. 16-30 | 98.6 | 89 | 98.3 | 93 | 98.8 | 81 | 1 | .... |
| 7 | Oct. 16-30 | 98. | 80 | 98.6 | 98 | 98.5 | 98 | 1½ | .... |
| 8 | Oct. 16-30 | 98. | 90 | 99. | 96 | 98.3 | 73 | .... | ¾ |
| 9 | Oct. 16-30 | 98.3 | 90 | 98.6 | 95 | Discharged | | ⅛ | .... |
| 10 | Oct. 16-30 | 99.5 | 100 | 98.4 | 105 | 98.6 | 104 | 1½ | .... |
| 11 | Oct. 16-30 | 98.9 | 100 | 97.9 | 110 | 98.2 | 104 | 2½ | .... |
| | Average.... | 98.5 | 93 | 98.3 | 96 | 98.3 | 89 | | |
| | | | | | | Total..... | | 14⅞ | 2¼ |

COUGH AND EXPECTORATION AFTER TEST.

| Case | Cough | Expectoration |
|---|---|---|
| 1 | decreased | absent |
| 2 | absent | absent |
| 3 | decreased | decreased |
| 4 | stationary | stationary |
| 5 | decreased | decreased |
| 6 | decreased | decreased |
| 7 | decreased | stationary |
| 8 | decreased | decreased |
| 9 | absent | decreased |
| 10 | absent | absent |
| 11 | absent | decreased |

CLASS A.—PERIOD OF ENFORCED REST.

| Case | Period of observation 1902. | Weekly average T. and P. | | | | | | Weight after test | |
|---|---|---|---|---|---|---|---|---|---|
| | | Previous to test | | During test | | After test | | gain lbs. | loss lbs. |
| | | T. | P. | T. | P. | T. | P. | | |
| 1 | Oct. 30-Nov. 13 | 98. | 81 | 98.3 | 99 | 98.8 | 100 | 3⅜ | .... |
| 2 | Oct. 30-Nov. 13 | 97.9 | 80 | 98. | 93 | 98.5 | 89 | 4⅛ | .... |
| 3 | Oct. 30-Nov. 13 | 98.3 | 84 | 98.6 | 101 | 98.6 | 97 | 1¾ | .... |
| 4 | Oct. 30-Nov. 13 | 98.9 | 90 | 99. | 03 | 98.4 | 109 | 2¾ | .... |
| 5 | Oct. 30 Nov 13 | 98.3 | 94 | 98.8 | 97 | 98.6 | 94 | 2½ | .... |
| 6 | Oct. 30-Nov. 13 | 98.8 | 81 | 98.6 | 80 | 98.6 | 80 | .... | ¼ |
| 7 | Oct. 30-Nov. 13 | 98.5 | 98 | 98.6 | 100 | 98.5 | 100 | .... | ¼ |
| 8 | Oct. 20-Nov. 18 | 98.3 | 73 | 98.6 | 99 | 98.8 | 94 | 1¼ | .... |
| 9 | Discharged Nov. 13 | | | | | | | | |
| 10 | Discharged Nov. 12 | | | | | | | | |
| 11 | Discharged Nov. 13 | | | | | | | | |
| | Average .... | 98.4 | 86 | 98.5 | 96 | 98.6 | 95 | | |
| | | | | | | Total..... | | 16½ | ½ |

COUGH AND EXPECTORATION AFTER TEST.

| Case | Cough | Expectoration |
|---|---|---|
| 1 | decreased | absent |
| 2 | absent | absent |
| 3 | stationary | stationary |
| 4 | stationary | stationary |
| 5 | decreased | decreased |
| 6 | decreased | decreased |
| 7 | decreased | stationary |
| 8 | decreased | decreased |
| 9 | discharged | |
| 10 | discharged | |
| 11 | discharged | |

CLASS B.—PERIOD OF ENFORCED REST.

| Case | Period of observation 1902 | Weekly average T. and P. | | | | | | Weight after test | |
|---|---|---|---|---|---|---|---|---|---|
| | | Previous to test | | During test | | After test | | gain lbs. | loss lbs. |
| | | T. | P. | T. | P. | T. | P. | | |
| 1 | October 16-30 | 98·8 | 109 | 98·7 | 101 | 98·8 | 87 | 6¼ | .... |
| 2 | October 16-30 | 98·7 | 96 | 97·9 | 86 | 98·5 | 80 | 2¼ | .... |
| 3 | October 16-30 | 98·1 | 103 | 98·5 | 103 | 98·5 | 100 | 1½ | .... |
| 4 | October 16-30 | 97·8 | 95 | 97·5 | 90 | 98·2 | 103 | 3¼ | .... |
| 5 | October 16-30 | 98·2 | 92 | 98·9 | 103 | 98·5 | 84 | 1¾ | .... |
| 6 | October 16-30 | 98·1 | 94 | 98·3 | 99 | 98·2 | 89 | 2½ | .... |
| 7 | October 16-30 | 98· | 95 | 97·7 | 96 | 98· | 98 | sta'n ary | |
| 8 | October 16-30 | 98·8 | 112 | 98·3 | 119 | 98·5 | 127 | 7¼ | .... |
| 9 | October 16-30 | 97·7 | 101 | 98·9 | 90 | 98·2 | 88 | .... | 1 |
| 10 | October 16-30 | 99·1 | 107 | 99· | 115 | 98·5 | 110 | ¾ | .... |
| | Average.... | 99·3 | 100 | 98·3 | 100 | 98·4 | 98 | | |
| | | | | | | Total..... | | 26 | 1 |

COUGH AND EXPECTORATION AFTER TEST.

| Case | Cough | Expectoration |
|---|---|---|
| 1 | decreased | decreased |
| 2 | stationary | stationary |
| 3 | decreased | decreased |
| 4 | stationary | stationary |
| 5 | stationary | stationary |
| 6 | stationary | stationary |
| 7 | increased | increased |
| 8 | decreased | increased |
| 9 | decreased | absent |
| 10 | increased | increased |

CLASS B.—PERIOD OF INCREASED EXERCISE.

| Case | Period of observation 1902 | Weekly average T. and P. | | | | | | Weight after test | |
|---|---|---|---|---|---|---|---|---|---|
| | | Previous to test | | During test | | After test | | gain lbs. | loss lbs. |
| | | T | P. | T. | P. | T. | P. | | |
| 1 | Oct. 30-Nov. 13 | 98·8 | 87 | 98·7 | 99 | 99·1 | 96 | 2¼ | .... |
| 2 | Oct. 30-Nov. 13 | 98·5 | 80 | 98·9 | 90 | 98·6 | 93 | .... | ½ |
| 3 | Oct. 30-Nov. 13 | 98·5 | 100 | 99·1 | 83 | 98·8 | 114 | .... | ¼ |
| 4 | Oct. 30-Nov. 13 | 98·2 | 103 | 98·2 | 103 | 99·2 | 102 | ¾ | .... |
| 5 | Oct. 30-Nov. 13 | 98·5 | 84 | 99· | 100 | 98·6 | 97 | 2¼ | .... |
| 6 | Oct. 30-Nov. 13 | 98·2 | 98 | 98·4 | 91 | 98·1 | 99 | 1 | .... |
| 7 | Oct. 30-Nov. 13 | 98· | 98 | 98·3 | 88 | 98·2 | 98 | ⅜ | .... |
| 8 | Oct. 39-Nov. 13 | 98·5 | 127 | 98·8 | 120 | 98·5 | 123 | 2½ | .... |
| 9 | Oct. 30-Nov. 13 | 98·2 | 88 | 98·6 | 99 | 98·6 | 88 | .... | 1¼ |
| 10 | Oct. 30-Nov. 13 | 98·5 | 110 | 98·6 | 133 | 98·9 | 112 | 3½ | .... |
| | Average.... | 98·5 | 96 | 98·6 | 100 | 98·6 | 102 | | |
| | | | | | | Total..... | | 13⅛ | 2 |

CLASS B.—COUGH AND EXPECTORATION AFTER TEST.

| Case | Cough | Expectoration |
|---|---|---|
| 1 | decreased | decreased |
| 2 | stationary | stationary |
| 3 | increased | increased |
| 4 | stationary | decreased |
| 5 | increased | increased |
| 6 | stationary | stationary |
| 7 | decreased | decreased |
| 8 | decreased | increased |
| 9 | decreased | absent |
| 10 | increased | increased |

SUMMARY.—CLASS A.

| | | Period of increased exercises. | | Period of enforced rest. | |
|---|---|---|---|---|---|
| | | T. | P. | T. | P. |
| Weekly average T. and P. prior to test | | 98.5 | 93 | 98.4 | 86 |
| Weekly average T. and P. during test | | 98.3 | 96 | 98.5 | 96 |
| Weekly average T. and P. after test... | | 98.3 | 89 | 98.6 | 95 |
| Total number pounds gain in weight.. | | 14⅞ | | 16½ | |
| Total number pounds loss in weight... | | 2¼ | | ½ | |
| Cough.... | increased..... | – | | – | |
| | stationary..... | 1 | | 2 | |
| | decreased..... ..... | 6 | | 5 | |
| | absent ..... | 4 | | 1 | |
| Expectoration... | increased..... | – | | – | |
| | stationary ..... | 2 | | 3 | |
| | decreased..... | 6 | | 3 | |
| | absent ..... | 3 | | 2 | |

SUMMARY.—CLASS B.

| | | Period of enforced rest. | | Period of increased exercises. | |
|---|---|---|---|---|---|
| | | T. | P. | T. | P. |
| Weekly average T. and P. prior to test | | 99.3 | 100 | 98.4 | 96 |
| Weekly average T. and P. during test | | 98.3 | 100 | 98.6 | 100 |
| Weekly average T. and P. after test... | | 98.4 | 96 | 98.6 | 103 |
| Total number pounds gain in weight.. | | 26 | | 13⅛ | |
| Total number pounds loss in weight... | | 1 | | 2 | |
| Cough.... | increased in..... | 2 | | 3 | |
| | stationary in..... | 4 | | 3 | |
| | decreased in..... | 4 | | 4 | |
| | absent in..... .... | – | | – | |
| Expectoration... | increased in..... | 3 | | 4 | |
| | stationary in..... | 4 | | 2 | |
| | decreased in..... | 2 | | 3 | |
| | absent in. ..... | 1 | | 1 | |

From the latter it will be seen that the average maximum weekly temperature actually fell during and following the test in both classes, while even the pulse was not materially affected. With the weight there was a small balance in favor of the period of enforced rest in both classes, but it must be remembered in

this connection that most of these patients were above normal weight before the experiment was undertaken. In Class A during the period of increased exercise there was a total gain in weight of 14⅞ pounds and a total loss of 2¼ pounds, while during subsequent period of enforced rest there was a total gain of 16½ pounds and a loss of one-half pound. In Class B during the period of exercise there was a total gain of 13⅛ pounds and a loss of two pounds. While during the antecedent period of rest there was a total gain of 26 pounds and a loss of one pound. The effects of the experiment upon the symptoms may be gathered from the tables. It is worthy of remark, however, that in every instance the patients *felt better* during the period of increased exercise.

It is hardly necessary to add that all patients on exercise should be advised to rest, and in cases of recent activity to recline both before and after meals particularly with respect to the hearty meal of the day. This is an invariable rule in the German and Swiss sanatoria with which I am familiar and I believe it to be a good one.

The diet of the tuberculous patient is, of course, a matter of vital importance. There can be no hard and fast rules, however, applying to all cases alike. In a general way it will be determined by the amount of weight lost in a given case and the type of fever present. In the acute stage of the disease a heavy proteid diet would be as much out of place as if the case were one of typhoid fever. During this period liquid foods should predominate, but as the temperature subsides and the acute symptoms disappear, best results undoubtedly follow a return to the more normal relations of the various elements of a mixed diet, with this exception that the proteids should be largely increased both relatively and actually.

With the ordinary patient, unless weight is far below normal, three hearty meals per day suffice to produce a gain of from one to five pounds per week during this life in the open air until the individual average is approached, when gain will naturally be less rapid.

In cases where response to treatment is sluggish, the regular meals are supplemented by additional diets at stated intervals, consisting usually of milk, eggs, broths, cocoa, etc., prepared in various ways according to individual tastes. Forcing diet beyond the point of comfort is, in my experience, an unwarrantable practice and is almost surely to be followed by anorexia dyspepsia, nausea, diarrhea and other abdominal symptoms. On the other hand if the patient merely has a disinclination for food without evidence of tuberculous lesion in the digestive tract, "gavage" may be practised for a time, and as you know with astonishingly good results in certain cases. There is this advantage in "forced feeding," the stomach which has heretofore revolted at any considerable amount of food ingested in the ordinary way, accepts the introduction of large amounts via the tube, and in a surprisingly short time the patient is enabled to take his food by the natural process.

With regard to the diet of quiescent cases, I have ascertained by experiment at the Loomis Sanatorium Annex that which gave the most satisfactory results by placing six selected patients at a table by themselves and carefully weighing all food consumed for a period of one week and averaging the amounts of each constituent per day per patient. The results of my experiment correspond very closely to those obtained by Bardswell, Goodbody and Chapman in the sanatorium wards of Brompton Hospital.[7]

The following table shows the comparison between the diets at Brompton and the Loomis Sanatorium Annex:

| | Loomis Sanatorium Annex. | Brompton Hospital. |
|---|---|---|
| Soups | 5.5 ounces | 0. ounces |
| Cereal | 3. " | 0. " |
| Meat and Eggs | 9. " | 8. " |
| Bacon | 0. " | 2. " |
| Vegetables | 12. " | 6. " |
| Bread | 8. " | 7. " |
| Butter | 1. " | 3. " |
| Milk | 62. " | 48. " |
| Cocoa | 4. " | 0. " |
| Sugar | 1.5 " | 1. " |
| Dessert | 2.5 " | 3. " |
| Fruit | 6.2 " | 0. " |

During this week the average gain in weight per patient at the Loomis Sanatorium Annex was 1.3 pounds. It will be seen that the diet at the Loomis Sanatorium was somewhat larger than that at Brompton, but in both cases they were found to be eminently satisfactory.

A word must be said on the employment of hydrotherapeutics in sanatorium treatment of this class of invalids. It has been proved very conclusively that tubbing for the reduction of temperature in septic cases of tuberculosis not only is of little avail but is absolutely disastrous, and in the sense that cold baths are valuable in typhoid, they have no place in phthisis therapeutics. On the other hand, tepid sponging or employment of the wet pack during the hyperpyrexia of acute or advanced phthisis is to be recommended and in infirmary practice at the Loomis Sanatorium has proved the only useful adjunct to absolute rest and proper feeding in controlling the fever.

Alternate hot and cold douching, under pressure, the shower, spray and other refinements of "water treatment" have a definite and considerable value in quiescent cases when elimination is deficient, and the appetite and digestion imperfect, and as a feature of sanatorium treatment therefore a hydrotherapeutic equipment is essential in the institution.

Occupying the mind of the patient with agreeable, healthful and not too stimulating diversion becomes one of the many problems in the sanatorium. In our climate during the summer, the

wealth of outdoor amusement is such that no difficulty is experienced in the selection of suitable recreation. For ambulant cases croquet, when played as Knopf suggests, with long handled mallets, answers the purpose very well; golf is a most appropriate and healthful amusement, though until the disease is completely arrested the full swing should be strictly forbidden and only the short plays allowed, quoits, outdoor bowling and archery practice have from time to time been popular among the patients of sanatoria and are unobjectionable. Driving, walking and hill-climbing are, however, with us the staple outdoor amusements. In winter the list of possible open air diversions is more restricted. An attempt has been made this winter at the Loomis Sanatorium to introduce some of the Swiss and Canadian amusements, such as skiing, snowshoeing, skating and coasting, so far with only favorable results. In any case, however, winter or summer, a constant vigilance must be maintained to prevent dangerous excesses. The physician must indeed live with his patients—indoors and out-of-doors—and maintain that watchful supervision without which the sanatorium wherever situated whether in the high Alps, the Rocky Mountain plateaus or at the seashore, is an utter failure.

I have purposely not entered upon many very important questions of institutional management and administration, because significant as they are, they do not directly pertain to a discussion of sanatorium treatment. For instance the sanitary arrangements, disposal of sputa and other excreta, disinfection of apartments, bedding and clothing, sterilization of dishes and eating utensils, supervision of the laundry, water supply and innumerable other matters of the utmost importance to the successful management of the sanatorium, but which would divert present discussion from the subject assigned me.

Finally, to sum up in a word, sanatorium treatment of tuberculosis consists in placing the patient in the best possible environment to effect an increase in resistance and to counteract the effects of toxins and waste. To accomplish which we must secure to him, (1) An increased amount of sunlight; (2) enforced rest in the open air day and night; (3) increased consumption of proteids; (4) accurately governed exercise; (5) constant and unremitting medical supervision.

If these desiderata can be successfully secured to him at his home—well and good—so much the better, but from an experience of more than fifteen years in private and institutional practice, with chief interest always centered in the difficult questions of phthisio-therapeutics, I have but rarely seen in the home those fortunate conditions which would allow of anything approaching in value, the benefits of the sanatorium to the consumptive patient, and in conclusion I can but reiterate that whatever in the future may be in store with regard to the therapeutics of tuberculosis, the methods of Brehmer must always hold a place and a vitally important place in the treatment, care and education of the consumptive.

I desire to here acknowledge the valuable aid of my assistant, Dr. William J. Hammer, in looking up and formulating references employed in preparing this paper and in his enthusiastic assistance in carrying out the experiments quoted.

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## MEDICAL PROGRESS.

### MEDICINE.

**Blood Cultures in Lobar Pneumonia.**—In a recent investigation the attempt is made to establish more definitely the frequency and time of general pneumococcus invasion of the blood stream and the diagnostic and prognostic value of blood cultures in lobar pneumonia, and also to study the agglutinating and bactericidal actions of pneumococcic blood serum. Eighty-three cases were studied, and positive results obtained in 77. E. C. Rosenow (Medicine, June, 1903) concludes from these experiments that the pneumococcus can be recovered from all cases, if large quantities of blood are used for inoculation, and in obscure cases may be a point of diagnosis of positive value. He agrees with the usually accepted opinion, that pneumococcemia in pneumonia is of no special prognostic value. On account of the difficulties involved, agglutination of the pneumococcus is, at present, of scientific rather than of practical value. Normal and pneumonic blood and serum appear to have no bactericidal influence on the pneumococcus. The interesting question whether lobar pneumonia is the primary result of a direct local infection of the lung, or of a secondary localization in the lung of pneumococci in the blood, is as yet hardly ripe for final discussion.

**Effects of Rest in Bed in Phthisis.**—The favorable effects of rest in bed on the fever of phthisical patients are explained by Pickert (Münch. med. Woch., May 12, 1903) on the ground that the horizontal position assumed, produces circulatory conditions in the lung, which resemble the congestion hyperemia in bone tuberculosis. In the latter instance this phenomenon is known to have a favorable effect. If this theory is correct, the fever ought to return or be increased, whenever the lungs become anemic. Observations have shown that if patients who have been kept in bed until the fever had about disappeared, were permitted to remain up for a certain length of time, the temperature would be immediately increased. The amount seemed to depend to some extent on the fact, whether the feet were allowed to rest on the floor, or kept in a horizontal position. In the former case, the venous hyperemia in the lower extremities undoubtedly produced a diminution in the quantity of blood in the upper parts of the body. Systematic trials showed, in fact, that the difference amounted at times to 1.5° on those days when the patients had assumed the erect posture.

**The Prophylactic Value of Urotropin in Typhoid.**—In a certain number of cases of typhoid, there is a more or less marked excretion of typhoid bacilli in the urine. Urotropin has been employed in a number of

instances, but was found merely to inhibit the growth of the bacilli, and not to cause their disappearance. E. FUCHS (Deut. Arch. f. klin. Med., Vol. 70, No. 1) has lately made some further experiments to determine its prophylactic value. The excretion of the bacilli begins just before or shortly after defervescence, and should continue well into the period of convalescence. The cases observed were divided into two groups, the first included 75 in which no prophylactic measures were attempted. In 10 per cent. typhoid bacilli were found in the urine. In 40 cases 2 grams of urotropin were given daily during the time above indicated, and in only one case, and that a severe one, were any bacteria found in the urine. The author explains the action of urotropin in these cases as follows: In a certain number of instances typhoid bacilli find their way into the circulatory stream and are excreted by the kidney. During their stay in the urinary passages they may multiply and become encysted in certain localities, preferably the pelvis of the kidney and the bladder, and remain quiescent for a long period. Urotropin administered at this time has no effect, as its action is entirely an inhibitory one and does not reach the encysted bacteria. However, if the drug is administered before this can take place, further multiplication is stopped and the remaining germs are excreted. The author is convinced from his experience that the prophylactic use of urotropin in typhoid will absolutely prevent the appearance of the germs in the urine.

**Axillary Adenopathy and Incipient Tuberculosis.**—The importance of axillary adenopathy in the diagnosis of incipient pulmonary tuberculosis was first pointed out by C. Fernet in 1899. According to this author, the condition is present in one-third of the early tuberculous cases; and Allard in 1901, observed 13 cases, within a few months, in which two to three enlarged glands were present either at the apex of the axilla or upon its internal wall. S. CERAULO (Gazz. Osped., May 24, 1903) has made a study of the clinical value of this sign in 11 cases in which there was strong reason for suspecting incipient pulmonary tuberculosis. Bacilli were present in the sputum of two of the cases studied. Enlargement of the axillary glands was found in but one case out of the total number. Ceraulo considers cardiac palpitation and phosphaturia of far greater importance in the diagnosis of incipient tuberculosis; the former having been present in seven cases out of 11, and the latter in nine. These two symptoms, accompanied by fever, cough, etc., he holds to be highly suggestive of incipient pulmonary tuberculosis.

**Arrest of Tuberculosis by a Secondary Infection.**—A contribution to the solution of the question concerning the possibility of the arrest of pulmonary tuberculosis by a secondary infection is made by T. SILVESTRI (Gazz. Osped., May 24, 1903). The author reports two cases of undoubted pulmonary tuberculosis—the diagnosis having been confirmed by bacteriological examination of the sputum—in which a permanent cure followed what he believes to be a secondary streptococcic infection. This was marked by chills, high fever, headache, delirium, lumbar pains, epistaxis, nausea, hemorrhagic macules upon the entire body, hemoglobinuria and blood-streaked feces. These symptoms persisted about fifteen days in both cases; and after their subsidence, a noticeable improvement was observed in the lungs, expectoration, cough and general condition; and at the end of three and four months respectively, a complete cure of the pulmonary lesion was seen in both cases, and the cure has been a permanent one. Examination of the blood was not made, but the author believes the secondary infection to be streptococcic; and bases this belief upon the findings of Haushalter and Etienne, which indicate that the hemorrhagic manifestations in variola, scarlatina and other exanthematous diseases are due to streptococcic infection. He attributes the healing of the pulmonary lesion to a modification of the soil by the secondary infection, which rendered the fertility and vitality of Koch's bacillus impossible.

**Laryngeal Spasm and Pseudomeningitis from Ascaris Lumbricoides.**—Two interesting cases are reported by G. PIERANTONI (Gazz. Osped., May 31, 1903), the first presenting the symptoms of laryngeal stenosis, the second those of meningitis. In the first, papillary mydriasis suggested the presence of ascarides, and upon administration of santonin and calomel followed by rectal injection, there occurred emission of ten ascarides, after which there was a complete subsidence of dyspnea, and no return of the spasmodic laryngeal attacks. The second case presented a perfect clinical picture of meningitis, though no focus of infection could be discovered. It was thought that the trouble might be attributable to auto-intoxication from the gastro-enteritis present, possibly combined with helminthiasis. Again administration of santonin and calomel was followed by emission of numerous ascarides and subsidence of symptoms. The author emphasizes the value of mydriasis as an indication of the presence of ascarides. Of special significance was this symptom in the second case, as it was present in the period of excitation, at which time myosis is seen in true meningitis. Pierantoni believes with Dematteis, who caused the death of rabbits by injection of an extract of *Ascaris lumbricoides* and reported the pathological findings in the animals post mortem, that these parasites secrete a toxic substance and to that are due the anemic and nervous symptoms seen in helminthiasis.

**Variations in the Liver.**—In the healthy subject, percussion reveals a variation in the lower limit of liver dulness amounting to two or three centimeters in one day, according to the conditions of the examination, such as the fasting state, before or after exercise, etc., writes C. MONGOUR (Jour. de Méd. de Bordeaux, May 31, 1903); and in gastro-intestinal affections and other diseases, notably in typhoid, the author has noted variations in the volume of the organ amounting to 4 or 5 cm. within a day. The variations in the liver's size in saturnism, alcoholism and cirrhosis of the liver have been carefully studied by Mongour. In saturnism and alcoholism, he found that during the first ten to fifteen days the liver remained unchanged in size; then succeeded a period of progressive augmentation of volume lasting about three weeks, at the end of which time there began a gradual decrease in volume, though the organ never entirely regained its original size; and from that time on it underwent the daily, normal variations of the healthy liver, this condition being reached after a cure was affected. Out of four cases of so-called atrophic cirrhosis with ascites, the lower limit of the liver remained unchanged in three patients after tapping of the fluid, and these succumbed to the disease; while in the fourth, the liver measured 7.7 cm. after the first tapping, 15 cm. after the second and 17 cm. after the third and last tapping; and from this time on, the liver maintained an average of 14 cm. A cure of three years' duration is reported. In favorable cases, a decrease in the size of hypertrophic livers, followed by daily normal oscillations, after withdrawal of ascitic fluid, was also seen. From these findings the author concludes that such variations in the volume of the liver during the course of a given disease are of great importance in determining the functional value of that organ, and are an indication of the suppleness of the parenchyma and of its power to adapt itself to the

needs of the organism under the variety of conditions which influence its function.

**Poisoning by Lysol.**—Considering the almost universal use of lysol in obstetrical practice, it seems remarkable that more cases of poisoning are not reported. F. HAMMER (Munch. med. Woch., May 26, 1903) believes that such cases are not rare, but as the symptom complex attending them is little understood, their diagnosis is not a simple matter. He reports one case where, on account of the presence of fever during the puerperium, an intra-uterine douche of lysol (1 per cent.) was given. The patient had a placenta previa. Immediate collapse took place, and, although the woman rallied, another collapse with death followed on the tenth day. An autopsy was done and the author explains the case as follows: As a result of the intra-uterine irrigation, a quantity of the lysol solution was aspirated into a vein, some of which reached the brain and caused collapse, but from which the patient rallied. Part of the solution remained in the vein, causing an erosion of the vessel walls and leading to the formation of a thrombus. The latter gradually extended and finally caused death. The author also carried out some animal experiments, by injecting solutions of various strengths under the skin in mice. The results confirmed the observations made at the autopsy of the woman detailed above, and led to the caution that when this drug is used for intrauterine irrigations, it must be used in very weak solution. Any marked degree of pressure must also be avoided, especially in cases of placenta previa, on account of the more gaping condition of the veins.

**Colon Infection Simulating Typhoid.**—It is now possible to distinguish between typhoid and paratyphoid infections, although the clinical course of the two diseases may be very similar. The question arises whether there may not be a type of disease resembling these, but produced by an organism closely simulating their specific bacilli, namely the colon bacillus. The blood serum of animals infected experimentally with different varieties of the colon bacillus will cause it to agglutinate promptly. There seems to be good reason to believe that in certain forms of pyogenic colon infection the specific reaction with the colon bacillus has been obtained, but owing to the great variability in this organism, the results have been very confusing. J. EVANS and J. SAILER (Univ. Penn. Med. Bull., June, 1903) report a case of this kind, of continued fever, in which the blood did not react to either the typhoid or the paracolon bacillus, but where the disease was actually due to a general colon infection. The patient appeared to have an ordinary attack of typhoid, but the blood constantly showed a negative reaction with the typhoid bacillus. The same result took place with the *Bacillus paratyphosus*. Tests were then made with cultures of *Bacillus coli communis* with a positive result, agglutination taking place even in a dilution of 1:100. All sources of error were carefully considered by the authors and they conclude that the case was one of pure colon infection. A direct blood culture was not made.

## SURGERY.

**Auto-epidemic Skin-grafting.**—A very convenient and seemingly efficacious method of skin-grafting is described by H. F. MCCHESNEY (Med. Rec., June 13, 1903). After the area has been gotten into a healthy condition it is cleaned off with Tiersch solution and then irrigated with normal salt-solution. The surface is dried with gauze sponges and where granulations are firm and healthy grafts are applied directly. If exuberant, they are cut down and where flabby they are cut away till a firm fibrous foundation is reached. Then the thin blue line of epithelial cells that have started to creep in along the edge of the wound is dissected up and small pieces about an eighth of an inch square are cut off and placed on the granulating surface already prepared. These are placed with the raw surface against the newly prepared surface and covered with pieces of oiled silk protective about an inch square. These newly developed epithelial cells are very active in their growth and the grafts take very well. At each dressing new islands may be started with very little discomfort to the patient.

**Excision of Tongue.**—One of the most remarkable series of cases of major operations is that reported by W. WHITEHEAD (Practitioner, May, 1903), who described his operation for excision of the tongue in 1891 and cited 130 cases, upon whom he had operated with only three deaths. He has since operated upon 50 more cases without any deaths. These patients include only those in whom the growth was confined to the tongue. In regard to the differences of opinion among surgeons relative to the method of excising the tongue, he says that there are four principal disputed points: (1) Division of the jaw; (2) the use of the écraseur; (3) preliminary tracheotomy, and (4) preliminary ligature of the lingual arteries. Division of the jaw he considers unjustifiable because of its great danger and because of its needlessness, even when the glands are removed. The use of the écraseur is a notable example of deviation from the common principles of surgery and the instrument should never be employed. Since the operation which he recommends guards sufficiently against the air passages being invaded by blood and septic materials he never advises a preliminary tracheotomy and maintains, furthermore, that the mortality from this preliminary operation is even greater than from excision of the tongue. Preliminary ligature of the lingual arteries is also held to be unnecessary for the average surgeon can more easily secure the arteries in the mouth than in the neck. In describing his method of operating he lays much stress upon the position of the patient, which should be such that a change from an upright to a horizontal position may be secured at a moment's notice. He always uses an ordinary rocking chair with high back and the patient's shoulders are fastened to the back of the chair by a towel passing under the arm and over the shoulder, but not across the front of the chest. Any desired position of the body can thus be obtained quickly without any embarrassment of respiration. The tongue is first seized with a pair of forceps and a strong ligature passed through it for traction which is very important. The frenum is then divided by scissors and one blade slipped under the mucous membrane at this point and carried along the floor of the mouth on one side to the pillar of the fauces when the scissors are closed. The same is done on the other side when the whole tongue is to be excised and when the anterior pillars are cut nearly the whole tongue can be pulled out of the mouth, and there need be little fear subsequently of blood getting into the air passages. If the operator is then afraid to cut further with scissors or scalpel he may use a blunt dissector from this point on, by which the tissues may be broken down and torn asunder, exposing the arteries and nerves. The arteries should be clamped, the distal end cut and the stump twisted. If there is no immediate bleeding subsequent hemorrhage need not be feared. Having twisted each artery, he advises that a loop of a strong ligature be run through the stump to prevent its falling back too far when the tongue is finally removed. It is also of service in case of secondary hemorrhage, a very remote contingency. Complete separation may be done by snipping or twisting. After the bleeding from the vessels has been stopped and the floor of the mouth dried as much as

possible, a varnish should be applied to the floor of the mouth. He uses an application made by substituting for the spirit ordinarily used in the preparation of "Friar's balsam" a saturated ethereal solution of iodoform, adding one volume in ten of turpentine. The patient is thus able to take liquid nourishment almost immediately after the operation. The patient should be propped up in bed during the first night and should be encouraged to get up on the second or third day. As a sound principle in surgery, it is always desirable, where malignancy is suspected, to expose as far as practicable the whole area of associated glands and to remove every visible particle of fat and gland just as we proceed to clear out the axilla in mammary cancer. It is a well-known and encouraging fact that in cancer of the tongue death generally takes place before dissemination has extended beyond the limits of the cervical glands—that in fact up to the very end, the extent of the disease is within the range, if not the possibility, of surgical eradication.

**Cancer of Lips.**—An excellent series of articles upon epithelioma of the lips and tongue appears in the Practitioner, May, 1903, and in one of these T. STOKER shows that cancer of the lip has been gradually increasing in frequency during the last decade. He does not believe that heredity is at all an important factor in etiology but lays a great deal of stress upon the use of the clay pipe so common among the poorer classes of Ireland, where this affection is most frequent. This disease is rare among non-smokers. Furthermore the cancer usually appears on the side on which the pipe is held and in one very unusual instance of cancer in the middle of the lip it was found that it was the habit of the patient to hold the pipe in the center of his mouth. It is doubtful if syphilis is of any importance as a predisposing cause. The great bulk of cases are in persons over fifty years of age. It is practically never seen in persons under thirty. The freedom of women from cancer of the lip is notable, but this depends undoubtedly not upon the sex but the habit of smoking, which is so rare among them. The upper classes are also comparatively free from the disease, a fact which is explainable by their greater care of their teeth and mouth, but especially because they use a pipe, if they smoke one at all, not made of clay. The clinical course is tolerably definite, spreading to the lymphatic glands below the jaw and later down the neck. The salivary glands are not affected till late and it is very unusual for the tongue to become cancerous, secondary to the lip. In fact, metastatic growths may be looked upon as unknown, death from exhaustion, septic disease of the lungs or hemorrhage, preceding their possibility. The only two conditions to be confused with epithelioma in diagnosis are sarcoma and syphilis. The former, if seen early, will be found to have commenced in the substance of the cheek. It is a rare condition. If the history and examination does not make a case of syphilis clear, a short course of mercury will be conclusive. The only justifiable treatment is thorough excision as early as possible. Since, however, the only secondary manifestations are found in the glands of the neck till rather late in the disease one should not despair too early, even when the disease has become extensive. Operations have been done for recurrences several times with ultimate success.

**Status of X-ray Treatment of Mammary Carcinoma.**—The general desire among physicians to find some more certain and less hazardous method of treating cancer of the breast than radical extirpation, has undoubtedly led many to speak too enthusiastically of this means of eradication. W. J. MORTON (Med. Rec., May 30, 1903) does not believe that the improvement is so constant or so certain as many have seemed to indicate. In the earlier stages, especially when the growth is not deep, the disease is frequently successfully combated. In recurrent cases or in extensive involvements a cessation of growth or even temporary retrogression may be induced but a complete cure is very seldom seen. He urges, however, the use of the X-ray in the earlier cases, for even if a complete cure is not obtained no time has been lost, for the disease may thus be held in check for some time and the outlying fresh areas are easily cleared up. The case is therefore in better condition for the operation and the chances of complete cure are increased. Even in the hopeless and inoperable cases the treatment is justifiable not only on account of the moral effect, but also because of the undoubted prolongation of life, relief of pain and, at times, of an apparent permanent improvement.

**Hypodermoclysis in General Surgical Infections.**—The beneficent effect of hypodermoclysis in general infection is emphasized by G. TOMASELLI (Gazz. Osped., May 31, 1903) in his description of a case of acute osteomyelitis which had its origin in a severe traumatism and which became the focus from which a general infection spread. The condition of the patient gave little hope after local intervention; profound depression, hyperthermia, small frequent pulse, profuse diarrhea, erythmatous and hemorrhagic eruptions upon the skin, grave changes in the blood and numerous bacteria in that fluid, all pointed to a fatal issue. Incision and drainage of the medullary cavity brought about no improvement in the clinical symptoms; and, hyperthermia persisting, recourse was had to abundant injections of artificial serum. Two hypodermic injections of 500 c.c. each were given in one day and a third, of the same quantity, was administered the following day; after which there were slight remissions of temperature and a lessened depression was apparent. A fourth injection, upon the following day, was followed by marked improvement ;and a gradual disappearance of the symptoms of general infection ensued. Cultures from the blood, taken ten days after the last injection, no longer showed development of bacterial colonies and the patient made a complete recovery, which, the author believes, is largely due to the favorable influence upon the general condition of hypodermoclysis.

**Therapeutics of Artificial Venous Hyperemia.**—The attempt to influence local tuberculous processes by producing an artificial hyperemia was first suggested by Bier in 1892. Some further trials of this method are reported by HABS (Münch. med. Woch., June 2, 1903), who used it in over 300 cases, about 200 of which were tuberculous. Chronic inflammations of the joints of the knee, hand and foot were markedly benefited and in many cases the swelling entirely disappeared. This was especially noticeable in children, and the pain and spasm often subsided after a few applications. In other cases the condition grew worse and operation became necessary. The methods employed in the various diseases were as follows: In tuberculosis the constricting elastic bandage was applied during the first week twice daily and allowed to remain in place four to five hours. After this it was applied less day by day, until it was in use only one hour daily. Active hyperemia (hot air, etc.) was not used, but injections of iodoform were given in the presence of joint effusions or unopened abscesses. Large abscesses were incised and fistulæ curetted. In advanced cases, resections are of course indicated. In gonorrheal rheumatism, the elastic bandage should be left in place at least eight to twelve hours daily. After the fever and the pain have subsided, in addition, active hyperemia is employed for the absorption of effusions—a daily session of an hour in the hot sand or electric light bath. In cases of chronic joint adhesions follow-

ing trauma or inflammation, the bandage is applied twice daily for an hour, in addition to massage and exercises, and a hot air bath every third day. For joint inflammations due to chronic rheumatism, he prefers active hyperemia, by the hot air or the electric light bath. For incomplete callous formation, aside from massage and exercise, the passive hyperemia may be used for two hours daily. Freezing, frost-bites and the like are benefited greatly by the application of the elastic bandage twice daily for one to two hours. The method can be recommended for simplicity, painlessness and general utility.

**Talma's Operation for an Adherent Pericardium.**—A case of this type, which was finally succeeded by a general ascites, and in which ordinary methods of treatment were of no avail, is reported by P. CLEMENS (Münch med. Woch., June 2, 1903). As numerous instances are on record where benefit followed this operation in ascites due to hepatic cirrhosis, the patient as a last resort was subjected to the same procedure. The operation was done by Kraske under the Schleich method of infiltration anesthesia, and the omentum sutured to the abdominal wall in the usual manner. An improvement was noted for a time, but permanent relief was not secured. The author believes that failure in his case was probably due to the late date at which the operation was undertaken and also to the advanced cardiac lesion.

**The Abdominal Belt.**—A plea for the abandonment of the abdominal belt after celiotomy is made by M. KAHN (Phil. Med. Jour., June 6, 1903). He claims that the prevention of postoperative hernias depends to a large extent on the perfect approximation and suturing of the edges of the wound. The strength which it is necessary for the muscles to acquire cannot be gained by any supporting or restraining belt, but must be secured by proper exercise. The wearing of a belt relieves the muscles of their usual labor, and there supervenes the atrophy on non-use, whereas it would be desirable to have the hypertrophy of overuse. When the belt is discarded, the attenuated muscles are suddenly called upon to accomplish what is relatively an excess of labor. The author removes all dressings three or four days after the patient is up, sixteen to eighteen days after operation. He has had good results in all cases.

**The Administration of Ether by the Drop Method.**—A further report on this procedure, first suggested by Witzel, is made by F. BERNDT (Münch. med. Woch., May 19, 1903), who employed it with success in 120 cases. The injection of a small dose of morphine was recommended previous to beginning narcosis, but this the author has discarded as unnecessary. The ether is given in such small amounts that after-effects are not seen. In all cases the urine was examined for several days without finding a trace of albumin. The recovery in every instance was rapid. The method is briefly as follows: The patient is directed to count backward from 200, so as to stimulate deep respirations. The ether is then dropped very slowly on a Schimmelbusch or Esmarch mask, and after a certain degree of narcosis is attained, taking from ten to twenty minutes, a few drops of chloroform are given until the corneal reflex is abolished. The ether is then resumed and the chloroform may also be again given, a few drops at a time, whenever the patient appears to become restless. The patient's head should be kept low and bent sharply backward. When the chloroform is added, it is claimed that the heart is already stimulated and strengthened by the ether and so better able to resist the effects of this drug.

**Cocaine Herniotomy.**—In order to lessen the mortality for this operation in every way possible, and minimize the fear of serious results which seems so general among the lay people, it has been suggested and during the last year or more many surgeons have proven that the operation may be successfully performed under a local anesthetic. A. LYLE (N. Y. Med. Jour., May 30, 1903) has performed 15 such operations, and now uses the local anesthetic by preference, even when there is no contraindication to ether or chloroform. After cutting down upon the aponeurosis of the external oblique, the fibers of which may be easily separated, the iliohypogastric and ilio-inguinal nerves can usually be easily found and two or three minims of a quarter of one-per-cent. solution of cocaine should be injected into the trunks. If the genital branch of the genito-crural nerve can be found that, too, should be cocainized. The operation may then be proceeded with without pain to the patient and a thoroughly radical operation performed. Care should be taken not to cut any good sized blood vessels, for there is always pain on ligating such a vessel unless the parts are thoroughly anesthetized. The cocaine solution should be fresh, hot, and sterile. The advantages claimed for this method are: (1) we have eliminated all danger of a general anesthetic to the heart, lungs and kidneys; (2) we have cut no nerves, consequently the nerve functions remain unimpaired; (3) not a single vessel has been ligated, for none of sufficient size for ligation has been divided, and (4) there is no shock, no nausea and no straining.

**Sodium Bicarbonate in Surgery.**—Solutions of sodium bicarbonate have been much lauded for the bathing and dressing of wounds, and in the treatment of atonic ulcers, especially the varicose. C. LEVASSORT (Jour. de Méd. de Paris, May 10, 1903) has had recourse to the drug in powdered form, dusting it abundantly into the wounds, ulcers, etc., and then tamponing with sterilized gauze. He allows the gauze to remain in cavities so treated from fifteen to twenty days; simply withdrawing and cutting off a portion of the dressing every two or three days as the cavity fills in with granulations from the bottom and sides. When the remains of the first dressing are removed, the author states, the work of repair is found to be well advanced; healthy granulations having formed and reduced materially the depth of the wound. A second dusting with sodium bicarbonate and dressing with sterilized gauze is said to complete the cure. Levassort has used this method of treatment for the past five years; and, in his experience, healing proceeds more rapidly with this method than with any other. The application of the soda is followed by some discomfort—burning and itching—but this is said to subside within fifteen to twenty minutes.

## OBSTETRICS AND GYNECOLOGY.

**Obstetrical Paralysis.**—In the infant the earlier writers appear to have assumed that this injury was due to direct pressure on the nerves, says WILLIAM THORBURN (Brit. Jour. of Obstet., May, 1903). Pressure on the neck, however, is incompetent to injure the lower roots of the plexus, while pressure in the axilla would not select for injury the fifth and sixth roots only. The appearance of Erb-Duchenne paralysis at the time of birth is not very common; statistics quoted by Duval and Gullain showing that it may be expected about once in 2,000 births, and that in the vast majority of cases delivery has required some operative interference, while nearly one-half have been breech presentations. Lateral stretching will obviously bear most heavily upon the upper cords of the plexus, and will thus explain the selection for injury of its fifth and sixth

roots. This brings the causation of obstetrical paralysis of the Erb-Duchenne type into line with that of ruptures of the entire plexus and allows the assignation of all cases to direct traction, the only difference being that in the former the plexus is stretched by deflection of the head, whereas in the latter the impact is more commonly received upon the shoulder. The prognosis of injuries of the brachial plexus, whether obstetrical or otherwise, is unsatisfactory and Bruns has recently shown that of all cases of partial injury, only 26 per cent. recover, whereas 66 per cent. of similar injuries to single nerves below the plexus undergo spontaneous cure. The treatment of obstetrical paralysis has, until recently, consisted solely in the use of warmth, massage, galvanism, and the like. In cases of the Erb-Duchenne type arthrodesis at the elbow may be of service, but though this measure was suggested in 1886 it is not known that it has been actually carried out by anyone. Of primary suture of the plexus and its root there are numerous cases. Kennedy has now extended the operation to obstetrical paralysis, and reports three cases in all of which the cicatrix was situated at the junction of the fifth and sixth cervical nerves. The first operation was performed two months after birth, the second fourteen years after, and the third six months after, and suggests two months as a reasonable period to wait for spontaneous recovery. The result was excellent, but the operations had been of too recent a date to judge what the final outcome of the cases might be. On the evidence before us it may be safely assumed: (1) That in the vast majority of cases of obstetrical paralysis the cicatrix will be found in accessible places at the junction of the fifth and sixth roots; (2) that recovery without operation is highly doubtful, and is certainly not to be expected unless marked improvement occurs within the first two or three months; (3) that if marked improvement does not occur within this period the plexuses should be exposed; (4) that perineural cicatrices should be removed and the nerves resected unless they are free from internal callus; and (5) the results of such operations are likely to be favorable.

**Double Pregnancy in a Double Uterus.**—A case of this variety in a woman, thirty-four years old, who had had three previous normal labors, is reported by J. B. HELLIER (Brit. Jour. of Obstet., May, 1903). She ceased to menstruate in the middle of May, 1902. During pregnancy the uterus was unusually large and there was a great deal of abdominal pain and edema of the feet. Labor began January 28, in the forenoon, and a living child was born at 5.30 P.M., the head presenting. The placenta followed. On abdominal palpation the presence of a second child was recognized, but the uterus showed but little tendency to expel it. At 11 P.M. the hand was introduced into the uterus and it was found to be empty. One hour later, on the second examination, a second os uteri was discovered above and in front of and somewhat to the left of the other, the uterus being rotated on its long axis, a fetal head was just within touch. The second child was delivered by podalic version, and the patient made an excellent recovery. A month later it was found that the uterus was bicornuate and that there was a complete septum reaching down to the cervix. After three pregnancies in one side or the other of the uterus, the two sides became pregnant simultaneously. When labor came on the head in the right descended and dilated the cervix, and in so doing prevented the descent of the other head. The fact that the left cervical canal lay anterior to the right is a phenomenon which has been noticed before. The change which involution produced in the cervix was also striking. The double canal and thick septum were so much in evidence after careful examination at the time of delivery, and yet a month later the septum was so much reduced within the os that the double nature of the uterus and the cervical canal might easily have been overlooked on simple, digital, vaginal examination.

**The Effects of Vaporization.**—A specimen, removed fourteen days after curettage and vaporization had been performed for irregular and frequent menstruation by G. F. BLACKER (Brit. Jour. of Obstet., May, 1903), illustrates very well the effects of superheated steam upon the mucous membrane and muscular tissue of the uterus. From the naked-eye appearance and the examination of the microscopic findings it was evident that not only the whole of the mucous membrane of the body of the uterus and the cervical canal had been destroyed by the action of the steam, but that a considerable part of the mucular tissue had also been destroyed in that part of the cavity of the uterus occupied by the intra-uterine canula. In order to avoid any risk of perforating the fundus of the uterus the end of the canula is not introduced up to the fundus of the uterus, and the large cavity present in the specimen extending of the point 1.8 cm. from the upper limit of the body of the uterus, no doubt represents the part of the uterus exposed to the cauterizing effects of the intra-uterine metal tube, and the extensive destruction of tissue is due not only to the action of the steam, but also to the heat of the tube. The specimen illustrates that by the use of superheated steam it is possible to produce complete necrosis of the uterine mucous membrane, and that where the action of the steam is continued for so long a period as ninety seconds, the destructive action of the heated metal tube must also be taken into consideration. By the use of this method, therefore, complete destruction of the uterine mucous membrane can be obtained almost with certainty. From the entire absence of the glandular or lining epithelium in the specimen, it is evident that no regeneration of a perfect mucous membrane could have taken place. The further examination of the specimen entirely fails to show any evidence of the presence of a carcinomatous growth. It is, however, possible that the destroyed tissues may have been the seat of early carcinomatous degeneration. In cases where the entire mucous membrane has been destroyed, its place is usually taken by a layer of connective tissue containing no glands and covered by a single layer of cubical epithelium.

**On Uterine Action.**—In an able and valuable work by a leading obstetrician of to-day, it is stated that "the principle not to deliver in the absence of uterine contractions is the first point in the prevention of post-partum hemorrhage. Do not pull away the placenta without waiting for uterine contraction." In traction with forceps, he says, "pull with the pains, leaving off pulling between the pains." To this principle so laid down, WM. STEPHENSON (Brit. Jour. of Obstet., May, 1903) takes exception for the following reasons: (1) There are no clinical data in its support; (2) it is not in accordance with the author's experience and that of others who, when necessity has arisen, have not hesitated to deliberately empty the uterus without waiting for pains, and without thereby inducing hemorrhage; and (3) the opinion is a logical deduction drawn from an erroneous idea of uterine action. First let us consider the behavior of the uterus during the operation of Cæsarian section. The operator does not wait for a pain, but as soon as the membranes are ruptured he must deftly remove the child, otherwise he would find himself hampered by the rapid closing of the walls, not from contraction, but retraction; the wall at once resiles when freed from the cause of expansion. Again, he does not wait for contraction before extracting the placenta, but peels it off trusting to retraction to restrain the

bleeding. Secondly, for various complications of pregnancy it has at times been deemed advisable to empty the uterus artificially without at first inducing labor. The cervix is dilated and the child removed without waiting for or even desiring uterine contractions. Does the uterine cavity remain undiminished though empty, and does hemorrhage occur more frequently than under other circumstances? Thirdly, take a case of excessive hydramnios, where the patient is suffering much pain, and from difficulty of breathing she cannot lie down. To afford relief one does not wait for labor to set in but ruptures the membranes without hesitation, and the uterus will steadily retract. Fourthly, in severe hemorrhage in the third stage with retained placenta, or post partum where the uterus has melted away from the grasp, and the fundus cannot be defined by the left hand externally, the author has invariably introduced the right hand to remove the retained placenta. Here one can observe the difference between the sudden closing in the cavity by contraction and the more gradual, often slow, but progressive, action of retraction. The latter is by far the most frequent result. With such evidence as the above study of the subject, can there be any doubt that, apart from contraction, the uterus possesses the power of reducing its volume and capacity when emptied of a part or the whole of its contents. Although Duncan said at the time that he wrote, "that retraction is not dependent is difficult to prove," now that we possess clearer views on this subject his other statement must be accepted as true that, "retraction is a separate and distinct function, that is, it may go on without contraction."

## NEUROLOGY AND PSYCHIATRY.

**Position of the Head in Cerebellar Disease.**—In a current number of Brain DR. FREDERICK E. BATTEN discusses the diagnostic value of the above by attempting to answer three very important questions: (1) Is a definite attitude assumed in cerebellar disease? This is often met with, but is not necessarily present throughout the course of the disease. It is manifest in an approximation of the ear, on that side of the body opposite to the lesion in the cerebellum, to its adjacent shoulder, and in the direction of the face toward the affected side. (2) Is this attitude the same as that following upon an experimental lesion and is the symptom itself of diagnostic value? Only in certain particulars, the following conditions being contrary to those obtained on experimental lesion: Approximation of ear to shoulder on opposite side; reflexes absent on same side; no anesthesia nor analgesia; nystagmus to opposite side. The symptom is less important perhaps than incoordination or weakness viewed from a diagnostic standpoint. It should not be the basis of a positive diagnosis but is to be considered merely as auxiliary evidence. (3) Is this position assumed in intracranial tumor in the absence of gross lesion of the cerebellum? Yes, the symptom occurred in a case cited and was probably due to blocking of foramina around the fourth ventricle. Too much importance should not be attached to the position of the head alone, but more indicative symptoms, such as those already mentioned, must be carefully sought for.

**Regeneration of Posterior Spinal Roots.**—An experimental study for the purpose of determining whether posterior roots are capable of regeneration in their intramedullary portion, has been made by W. G. SPILLER and C. H. FRAZIER (Univ. Penn. Med. Bull., June, 1903). The advisability of the operation recommended by them for the relief of tic douloureux—the resection of the sensory root of the trigeminus—depends largely on the absence of regeneration of these posterior root fibers within the spinal cord, because if the posterior roots are incapable of regeneration, we may assume that the sensory root of the Gasserian ganglion likewise is incapable of regeneration. The experiments were carried out on dogs. A laminectomy of two or three vertebræ was sufficient to expose several pairs of roots. The posterior roots were transfixed at two points with needle and fine silk, a short distance apart, and divided between these points. By tying the suture the divided ends were brought into perfect apposition, and then the external wound was closed. Only one of the animals lived sufficiently long (10 months) for the purpose of drawing any conclusion. Examination showed that the intramedullary portions of the roots operated upon were entirely degenerated, and no young nerve fibers could be seen anywhere in the usual distribution of the posterior roots within the cord. Degeneration could not be seen by the Marchi method, because all signs of recent degeneration, as shown by this method, had disappeared on account of the long time the animal was allowed to live after the operation. Although the conditions were most favorable in this case, no regeneration whatever took place.

**Neuroses from Prolapse of the Kidney.**—The more common of the nervous symptoms accompanying kidney prolapse are, according to A. H. GOELET (Ann. of Gyn. and Ped., June, 1903), vertigo, syncope, palpitation of the heart, restlessness, insomnia, frequent micturition, hysteria and neurasthenia. How often these may be due directly to irritation of the solar plexus it is impossible to say. They are dependent somewhat on gastro-intestinal disturbances, which may themselves be due to irritation of the symphathetic or to direct traction by the kidney on the duodenum. With the kidney prolapse there is constantly associated pain in the kidney region, in the ovarian region, in back, thighs and even the head. Irritability of the bladder, most manifest during the day, may be purely neurotic. The constant suffering, or dragging sensation, or fatigue on slight exertion, together with the digestive disturbances, may lead to hysteria or to neurasthenia. Such patients are never relieved until the kidney is completely detached from the colon, and permanently fixed in its normal position. Albaran believes that the movable kidney is a cause of constant internal trauma, and thus acts on the nervous system. The author thinks operation better than mechanical appliances, because (1) temporary relief of the symptoms does not mean cure; (2) the pressure of a belt or corset provokes undesirable irritation and may induce nephritis; (3) the operation has no mortality, and the cure is permanent.

**Influence of Alcoholic Liquors on Digestion.**—At present there is apparently no consensus of opinion regarding the influence of alcoholic liquors on digestion, probably on account of the different results obtained by various methods of experimentation, and also from the disposition to rely on clinical experience rather than on laboratory results. R. F. CHASE (Phil. Med. Jour., June 6, 1903) has lately made some experiments to determine what influence whisky and beer, taken with meals, had on gastric digestion. These articles, and also tea or coffee, were given with an Ewald's test meal on an empty stomach on alternate mornings. Analysis showed that salivary digestion was slightly delayed by whisky, and somewhat accelerated by beer. Peptic digestion, both in the stomach and in the test tube, was noticeably delayed by whisky and in a more marked degree by beer, in the latter case quite out of proportion to the amount of alcohol contained in the beer. Thus it would seem that liquor taken with meals, exercises on the whole only a harmful influence, while in cases of gastric disease its use is not followed by any beneficial results. The tests made with tea and coffee showed

that in the amounts ordinarily used, they do not retard either salivary or peptic digestion, but that salivary digestion is accelerated slightly by tea. The results also show that these fluids also act as mild stimulants to gastric secretion, the digestive power of the secretions is not augmented, but on the other hand is not impaired, as in the case of whisky. Admitting the generally harmful effects of large quantities of tea and coffee, the author believes that an undue prejudice has been excited against the use of these beverages by the results obtained from laboratory experiments.

## PATHOLOGY.

**The Influence of Formaldehyde on the Blood.**—The recent use of formalin in septicemia lends a peculiar interest to the research conducted by C. C. GUTHRIE (Am. Jour. of Physiol., June 1, 1903), on the effect of this gas on the coagulation and other phenomena of the blood. He found that coagulation is retarded in blood drawn into solutions of this gas in proportion to the amount of formaldehyde present. In sufficient amount, the latter prevents coagulation indefinitely. The average amount of formaldehyde necessary for this purpose in various animals, is 1 to 185.5 parts of the blood. Amounts of formaldehyde too small to prevent coagulation, prevent the clot from advancing beyond a delicate, jelly-like stage, for a period proportionate to the amount of formaldehyde present. The onset of spontaneous laking (solution of hemoglobin in the plasma) at room temperature, is not markedly delayed by small quantities of formaldehyde, but, once begun, it proceeds much more slowly than in normal blood.

**Infectivity of Scarlet Fever.**—During recent years there has been considerable change in the attitude of medical officers of health in regard to the communicability of scarlet fever. There is considerable doubt expressed now about the highly infectious nature of the disease during the later desquamating stages. L. C. PARKES (Practitioner, April, 1903) notes the change of view which has occurred in England and attributes it to the following reasons: (1) Desquamation is not a manifestation of scarlet fever alone and although more complete in this disease, yet the more moderate peeling of measles and Rötheln has not been considered as being of specially infective character; (2) the similarity between scarlet fever and diphtheria seems to point to an infective organism for the former similar in character to that of the latter. In each disease the tonsils and soft palate are the parts usually affected first. The tonsillar and buccal mucus is the home of the diphtherial contagion and it would seem probable that the same secretion is ordinarily the habitat of the scarlet fever virus; (3) fever hospitals which have taken to discharging patients before desquamation has ceased have not shown any increase in the "return" cases. Since the bacteriology of scarlatina has not yet been settled it is, of course, impossible to be positive about the most dangerous stages of the disease and hence it would perhaps be unwise to relax any of the present rules in regard to quarantine. In spite of the increasing numbers of carefully isolated cases each year there seems to be no appreciable difference in the prevalence of the disease, and as the expense incurred by this long confinement is such an important item, the necessity of it may well be questioned. The mortality of the disease, however, is constantly decreasing and is now only one-eighth what it was forty years ago. That again is another reason why less rigid rules may soon be expedient.

**Fruit Vessels, Mosquitoes and Yellow Fever.**—A practical investigation of this subject has been made by E. SOUCHON (Jour. Am. Med. Assoc., June 13, 1903), for the purpose of explaining certain facts in connection with the *Stegomyia* as a carrier of infection. The scarcity of *Stegomyia fasciata* on fruit vessels from ports quarantined against yellow fever was shown by the fact that out of 208 mosquitoes captured on a number of vessels plying between New Orleans and Central America, only 2.5 per cent. were of that species. In houses, however, the number was 40 per cent. The females were largely in the majority. The vessels plying between New Orleans and Havana furnished 16 per cent. of *Stegomyia*. During the fifteen years from 1886 on, only five cases of yellow fever were brought by these vessels to New Orleans, and in only one instance could the infection be traced to the ship, all the others, contrary to regulations during the quarantine season, had communication with the shore. The impunity of intercourse with non-infected vessels is shown by the fact that laborers constantly entered the holds of these vessels while in port and before fumigation had taken place and yet from 1886 to 1895 not one case of yellow fever originated in New Orleans. It was also found that the *Stegomyia* on non-infected vessels are not infected, as evidenced by the free intercourse just noted, although yellow fever was epidemic in the ports of call during the period in question. It is improbable that *Stegomyia* on infected vessels become infected before reaching the quarantine station because the percentage is so small (2.5 per cent.), the females must become impregnated before they will bite, the males on board are a few in number, the females must bite the patient within the first three days and cannot infect a human being until twelve days thereafter, the mosquitoes do not breed in sea or bilge water, the bitten subject must be non-immune and the cases on record are all primary. In the case of New Orleans at least, it is impossible for any mosquito to carry yellow fever into the city, because fruit vessels are not more than six days in transit before reaching the quarantine station, where all the insects are destroyed by fumes before the twelve days have expired. The author also found that mosquitoes will not live without moisture or water for more than three to five days during the summer months, which proves that there is very little liability of their being transported in baggage.

**Duration of Life of the Yellow Fever Mosquito.**—The laboratory experiments conducted by JUAN GUITERAS (Rev. de Med. Trop., April, 1903), to determine the duration of life in the *Stegomyia fasciata* are of special interest in view of the fact that that insect retains its infectivity throughout its life. He thus describes his work: Eighteen mosquitoes, which were hatched on August 1, 1902, were made to bite, on the fifth of that month, a patient suffering from a fatal form of yellow fever; and of this number, seven were killed for the purpose of studying their salivary glands and intestines. The remaining eleven died after a period of from five to one hundred and fifty-four days.

## THERAPEUTICS.

**The Action of Camphor on the Heart and Blood-vessels.**—The use of camphor in conditions of collapse and heart-weakness, according to H. WINTERBERG (Pflüger's Archiv, Vol. 94, Nos. 9 and 10), was founded originally on an empirical basis. The experimental investigation of the action of this drug on the mammalian circulatory system would seem to dethrone camphor from its place among the valued cardiac stimulants. The author found that the chief action of camphor upon the blood-vessels consists in a dilatation of the same, particularly in the areas of the vessels drained by the jugular and femoral veins. The point of attack in the production of this dilatation is to be sought in the periphery. The direct exhibition of camphor in the blood-current produces a slight and transient stimulation of the vaso-

motor centers, expressing itself occasionally in a slight rise in blood-pressure, followed by a rapid fall. Sometimes there are noticed, after the administration of camphor, certain undulatory variations in the blood-pressure, occurring at irregular intervals. These are to be attributed probably to a reflex excitation of the vasomotor centers, following the increased irritability of the latter produced by camphor. There is no evidence of any favorable action of the drug upon the work of the heart, although there is no evidence of any damage to the heart from small and moderate doses. The cause of the diminished blood-pressure is to be found in the dilatation of the smaller arteries. The consequent acceleration of the flow of blood and the synchronous diminution of frictional resistance, tend to explain the absence of change and even the slight increase of pressure in the left ventricle. The above results show no favorable action on the heart and reveal but an inconstant excitation of the vasomotor centers. The somewhat regular periodic rises of blood-pressure appear only after doses too large for therapeutic uses. The author's researches contradict the results of clinical experience, yet he would not withhold from camphor any medicinal value for, irrespective of its power of stimulating the cerebrum and the respiratory center, manifesting itself in an acceleration and deepening of respiration, the vasodilating property of this drug, by regulating the distribution and circulation of blood, is all the more significant, inasmuch as all the vascular territories do not share equally in this dilatation. Particularly the vessels of the splanchnic area are not dilated by camphor. Whether its capacity to lower the bodily temperature, and whether the common experience that after the subcutaneous administration of camphor, a hardly perceptible pulse is again made easily palpable, are to be attributed to this arterial dilatation, can only be determined by clinical investigations along this line.

**Two New Peroxides.**—This interesting class of chemical compounds has of late years received a large amount of attention. In a recent communication N. FRAENKEL (Progres Médicale, 1903, No. 2) has contributed a study on two metallic peroxides made from zinc and magnesium. These have been termed dermogen and diogen. The indications for use of these two new compounds are similar to those of other peroxides with certain modifications because of the presence of the metallic ion. Dermogen is a faintly yellowish powder, light, tasteless, odorless and insoluble in water. It is used externally almost exclusively and sets free nascent oxygen in about 9 per cent. Biogen is a light, tasteless, odorless and insoluble powder and is used internally. 1 gm. 15 grs. of the magnesium peroxide in the stomach is capable of producing one-half gram of hydrogen dioxide. Biogen is decomposed by the gastric juices, and the hydrogen dioxide formed is broken up and free oxygen results. This acts as an antiseptic and oxidizer and is thought to penetrate the tissues passing in through to the stomach wall. Its therapeutic indications have not as yet been thoroughly studied, but it offers an interesting field for clinical observations.

**A New Form of Focus Tube.**—In a paper on the subject of a new form of focus tube, C. W. ALLEN (Jour. of Cut. Dis., April, 1903) says that the rays from the target in the focus tube now in use do not emanate in all directions with equal intensity, but follow the same rule as light waves from a flat illuminated surface, and are the strongest in a line at right angles to the surface, and steadily decrease at every increase of the angle of obliquity. In the case of illuminating rays, as is well known, the decrease is as the cosine of the angle, and in a direction corresponding with that of the plane of the illuminated surface, the light becomes nil. In the case of the X-rays it may be assumed that the rule would be the same if the rays came from a geometric point, but on account of the size of the area from which the rays emanate, there are some rays at the plane of the anode. The greatest intensity of the rays is, as in the case of light rays, in a direction perpendicular to the plane of the anode, and in a line passing through a point in the anode at which the cathode stream impinges. It is therefore very inconvenient in the tube of ordinary construction to utilize these rays on account of their direction being away from the center of the tube and in a direction toward the cathode. In the tube presented by the author, devised by Dr. Milton Franklin, the rays of greatest intensity pass from a tube in the direction corresponding with the center of the free side of the bulb, and the strength of the rays at any angle to the right or left of this center will be the same. In aiming the rays at any part, an exact indication of the direction of the most powerful rays may be obtained from the annex through which the target support is directed. The essential feature of the tube, and wherein it differs from the others is in the position of the target and the cathode. The annex through which the target enters is placed midway between the other two provided for the second anode and cathode, and the plate of the target placed at right angles to its stem, presents a plane at right angles to a line passing through the free boundary of the tube midway between the anode and cathode annexes. The cathode is inclined to its stem in an angle of about 30 degrees so that the cathode stream impinges upon the target at an angle of about 60 degrees.

**Prophylactic Against Poisoning with Rhus.**—A thorough investigation of the nature of the poison of rhus discloses the fact that it resides in a poisonous oil which is communicated by osmoris from the lactiferous ducts of the leaves and stems to small hairs which grow upon the vessels and which are easily broken off and carried by wind or direct contact to the skin. C. SCHWALBE (Med. Rec., May 30, 1903) says that the ordinary neutral soaps will not neutralize the toxicondric acid, especially as these little hairs are liable to lodge and remain in the openings of the sudoriferous glands. If the exposed skin is bathed frequently with a one-half-per-cent. solution of potassium carbonate the poison will be destroyed. A 1 to 1½-per-cent. solution of ammonium chloride is also highly recommended as a prophylactic and also as a curative remedy.

**Calcium Chloride in Hemorrhage.**—In numerous instances, this drug has yielded, in the hands of J. C. REEVE (Am. Gyn., April, 1903) most excellent results in the control of bleeding. As it is well known, it is relied upon by Mayo Robson and others as a valuable means of forestalling chronic hemorrhage in gall-bladder surgery. Yet the latest works on therapeutics make no mention of it, and it has received but scant mention by the profession at large. Certain writers have even disputed its efficacy. The writer reports a case of a woman who entered his wards with profuse hemorrhage. Circumstances prevented operation at the moment and calcium chloride was prescribed. Several hours later the resident physician summoned the writer in haste under the belief that she had sustained an inversion of the uterus. A firm, pear-shaped body was found to be protruding several inches from the vulva with blood still trickling over its surface. On examination the tumor was found to consist solely of concentric layers of coagulated blood, which had grown as a stalactite grows, by successive depositions. Since the coagulum had formed only after the exhibition of the calcium salt the experience may be taken as going to prove the efficacy of the chloride of calcium in raising the coagulability of the blood.

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## WEIGHT AND MENSTRUATION.

MANY and varied theories have been evolved from the inner consciousness of supposedly observant gynecologists with regard to the nutritional changes incident to menstruation. A rather prominent physiologist and author of a text-book on physiology in England predicated a distinct connection between the moon and menstruation, since, according to a large number of statistics most women menstruated during the first quarter of the lunar month. What is needed in this matter is more careful observation to determine what are the nutritional factors and the effects on metabolism of menstruation in the human female. Dr. Belfield, of Chicago, in a recent number of the *Journal of the American Medical Association* (June 13, 1903), seems to have opened a new field of investigation in this matter. He has found that there is a distinct weight wave of menstruation, that is to say, shortly before menstruation there is a distinct gain in weight, followed by a still more rapid loss of weight immediately after the flow has ceased. This loss in weight is not at all proportionate to the amount of material lost as menstrual blood, which is, after all, only a trifle, seldom amounting to more than a few ounces in the normal woman.

Dr. Belfield has found that in winter especially from 2½ to 5 pounds, which may be from 1½ per cent. to 5 per cent. of the subject's usual weight, are gained during the four or five days immediately preceding the beginning of the menstrual flow. The climax of this gain is immediately followed by the rapid loss of a large part, perhaps half, of this increase in weight (often within eight to sixteen hours) and then a more gradual loss of the remainder, extending over several days. He has found further that the premenstrual gain in weight is due not to increased ingestion of food, but to the diminished excretion, especially of water. On the other hand, the rapid loss of weight following the crest of the wave, is due not to abstinence from food but to rapid excretion, especially of carbonic dioxide and water. In one case Dr. Belfield observed a loss of 2½ pounds in weight during the five hours following the appearance of the menstrual flow, though neither urine nor feces had been voided during that period, and though the subject had had no exercise other than that incidental to clerical office-work indoors.

These observations of Dr. Belfield's are confirmed by the fact often noticed by women that apparently their flesh feels firmer just before a menstrual period begins and that this may be the preliminary warning that the flow is about to commence when they have forgotten the exact date at which menstruation should occur.

Nearly every gynecologist must be familiar with this story, though it has usually been put aside as of no special significance, or as being one of these vain imaginings that women are so apt to have about this time. As might be expected under the circumstances, the temperature curve during these rather marked changes in metabolism is not constant. There is usually a rise of about 1° F. during the days in which the increase of weight is most noticeable and a sudden fall after the crest of the weight wave is passed. It is probable that there is a more than corresponding variation in the pulse since the rapidity of the heart action is even more dependent on general metabolism than is the temperature range.

These observations are of the direct objective character that mean a distinct gain in knowledge. Much remains to be done to supplement them in order to understand the metabolic principle on which they occur. It is not improbable that the mystery of the influence of the ovary on nutrition and of the question of an internal secretion from this organ, as seems almost surely to be the case, from many recent observations, may be solved by

the continuance of this investigation. The data are rather easy to obtain and there is opportunity for physicians in different parts of the country to tell us how much temperature and climatic changes of various kinds may influence metabolism in association with these menstrual alterations of weight and general condition. In a word, an attractive subject for investigation is here presented, upon which it is to be hoped many observers will find opportunities for research.

## "BERRIES AND CREAM."

The bray of the ass once more breaks the stillness of the air. An editorial in the New York *Times* of June 10, with the above heading, sarcastically points to the work of the German Consular office in estimating the number of bacteria contained upon the various fruit products that are consumed at this season of the year, with contemptuous ignorance and derision. Aspersion is cast at the counting of germs in milk and cream, and it is inquired, "What can be the popular value of this sort of information?"

Our esteemed contemporary has evidently lost track of the well-known happy results that have come from just such research work. What brought about the establishment of the now recognized indispensable Straus milk stations? It was nothing more or less than the painstaking investigation of the germ infection of the fresh milk and cream "just from the cow" that determined these to be the cause of the yearly death-dealing, devastating plague that each summer had carried off the children of the rich and the poor alike.

What induced John D. Rockefeller to donate millions of dollars toward the establishment of an institution for medical research of this kind?

It has been this selfsame sneering ignorance that has for centuries prevented the onward progress of science in all its branches, and it is painful to see it in the columns of one of the ablest of our New York dailies.

It is a well-known fact, even to the laity, that the spread of disease by means of infected fruits may readily take place. Epidemics of cholera and yellow fever have had their origin in the introduction of certain fruit products both in this and other countries. In Japan it is impossible to eat raw vegetables because of the liability of infection with the ova of certain animal parasites of many varieties, chief of which is the most annoying tapeworm. The Italian fruit vender, the purveyor of the city's fruit supply, polishes his wares by expectorating upon them and then gives to them a beautiful luster by means of a dirty rag pregnant with syphilis or what not. The farmer deposits his feces in the brook running through his ten-acre lot and the eggs of the harmless tapeworm and other parasites find a resting place upon the leaves of the favorite watercress, soon to make its way to our tables and thence to our alimentary tracts. The knowledge of these valuable facts were obtained in no other way than those which the New York *Times* would make the butt of an inane and senseless joke.

It is only too unfortunate that it is a difficult task to impress upon the minds of the laity the importance of preventive medicine. One is reminded of the story of the ignorant Irishman, who, when during an epidemic of typhoid fever, was told that it was best to boil his drinking water in order to escape infection, and by so doing the germs which caused the disease would be killed, remarked "that he would just as lave make an aquarium out of his stomach as to use it as a morgue."

The editorial ends with the sage remark that "Man cannot evade microbes, however he may try." Surely the *Times* has not forgotten that the eradication of the various cholera and other epidemics that carried away so many of our forefathers was brought about by the discovery of the presence of germs on various sorts of articles brought to our shores from other lands. The *Times* would be one of the first to raise a hue and cry if the quarantine officers were to permit to pass through them a shipload of oranges coming from a port known to be infected with some contagious disease.

## DISEASES OF HOT CLIMATES.

Our comparatively recent acquisition of territory in the American and Eastern tropics gives us a renewed interest in the diseases that affect especially tropical regions. The English establishment of schools of tropical medicine is an index of the practical interest which this generation realizes must be taken in the special diseases of different and distant countries if sanitary measures are to make living in colonial regions any more wholesome than it has been in the past. There has come in recent years moreover the precious realization that the comparative study of the diseases of the different parts of the world may very well serve to throw light upon even the best known diseases in the ordinary conditions of the temperate zone. Besides, with the increase of commercial activity

at the beginning of the twentieth century quarantine is ever of more vital interest and tropical diseases are found not to be absolutely limited to very warm climates but occur sometimes under rather alarming circumstances in the temperate zones.

In recent years many of our large cities have had cases of the so-called sleeping sickness in their hospitals. This has sometimes been considered an affection limited to the negro race. It is evident, however, that symptomatic conditions resembling the so-called sleeping sickness of Africa may occur among other races and without the predisposing influence of a torrid climate. In his recent book on diseases of warm countries, Dr. Scheube, late professor of medicine and pathology at the medical school of Kioto, Japan, reviewing the literature of sleeping sickness, declares that in the few autopsies recorded the pathological condition has usually been a meningo-encephalitis. He adds that Mauthner suggests a relationship between sleeping sickness and Wernicke's acute polio-encephalitis superior.

Almost needless to say, bacteria have been found in some of these cases and have been declared specific by certain observers. In Africa, the disease seems to be limited to negroes. This is sometimes attributed to the fact that the lethargic condition which develops is only a small exaggeration of the ordinary condition of the negro in South Africa whenever he is asked to be quiet for a time. Missionaries tell that it is practically impossible to keep the South African negro awake for sermons and instructions and their only hope is to use the Socratic method and keep asking frequent questions. Portuguese observers have found a short bacillus which they declare to be the cause of the disease, but so far their discovery has not been confirmed by others. Manson believes that the condition is usually due to the presence of the *Filaria perstans*, a small blood, worm-like parasite that has been found in some of the cases in North Africa, especially along the Nile, though it does not seem to occur in the southern part. It is possible that some of these suggestions may be useful in leading American observers to the more careful investigation of some of the cases of continuous lethargy that are reported from time to time in this country.

With regard to the interesting oriental conditions known as running amok, or amuck, during which the subject of an attack usually runs wildly through the street brandishing firearm or saber and killing every one whom he can reach, the present generally accepted theory is much more satisfactory than some of those formerly suggested. The condition used to be attributed to the inordinate consumption of certain crazing drugs. There is no drug known in the East, however, that produces any such excitant effect. The condition is now recognized as a temporary mania on an epileptic basis and in a number of recent cases scars have been shown on the tongue demonstrating the occurrence of previous attacks of epilepsy. The condition then is only one of these epileptic states with homicidal tendencies which are noted in other countries and which are making the path of the medicolegal expert and the proper enforcement of laws with regard to murder when committed by epileptic patients ever more and more difficult.

The distribution of the ordinary infectious diseases in the tropics is extremely interesting. Whooping-cough, apt to be considered with us rather a disease of cold weather, early spring and late fall, is very frequent and very fatal among the South Sea Islanders. In 1883 3,000 Fijians were carried off by an epidemic of this disease that we are apt to call one of the ordinary children's diseases. The distribution of epidemic parotitis, mumps, and acute muscular rheumatism is exactly the same and they are rather rare diseases in the tropics. There is no acute rheumatic arthritis in Manila or Singapore. This is an interesting commentary perhaps on the bacillary origin of rheumatism and hints at the probable absence of the microbe of the disease as yet in these parts.

Smallpox becomes a veritable scourge in the tropics and, curiously enough, the protection afforded by vaccination is not near so long-lasting in warm climates as in temperate regions. This shows the need for warning those about to go to warm countries of the advisability of having their vaccination renewed. There has been a general impression growing of late years that vaccination can not be depended on to protect for as many years as used to be thought, when the epidemics of the disease are as virulent as those which usually occur in the tropics. Measles is very common and more fatal than in the temperate zones, showing that the so-called catching of cold or exposure to low temperature is not as serious a cause of fatal complication in measles as is sometimes thought. Scarlet fever is not endemic in the tropics at all. When cases of the disease are introduced from without it does not spread and, at most, affects only those who have been in intimate contact with the patient. The scarlet fever itself

soon dies out. This is a very curious and rather surprising observation and may lead to the finding of some reason for the anomaly due to some characteristic of the microbic cause of the disease which has not as yet been definitely recognized. It may also serve as a criterion of any announced bacterial causes of the disease somewhat as exposure to cold was used with regard to bacteria found in yellow fever cases. It will be remembered that Professor Vaughan, of Ann Arbor, used this test for the effective rejection of Sanarelli's supposed bacillus of yellow fever.

## ECHOES AND NEWS.

### NEW YORK.

**Babies en Voyage.**—The first trip for the season of St. John's Guild Floating Hospital took place last week. The boat left the foot of West Fiftieth street with 338 people on board, including 78 babies. The boat then made stops at West Thirty-fifth street and West Tenth street, where 600 more passengers were taken on board. The boat proceeded down the bay and off New Dorp landed the children who were very ill, at the Seaside Hospital of the Guild. The Guild will operate only one boat this year, owing to lack of sufficient funds. John P. Faure, former Commissioner of Charities, who is in charge of the trips, said that more funds were needed for the work. Since last year the boat has been fitted with wards for dispensary service, and there is also a quarantine for contagious diseases on the upper deck.

**Program of the Summer School in Philanthropic Work.**—The sixth annual session, commencing June 22 and extending to July 31, 1903, is now in progress, being conducted by the Charity Organization Society of the City of New York, of which Philip W. Ayres is director. Dr. Silas F. Hallock, of New York, will be in charge of the meetings devoted to medical charities, for which four days will be allowed, as follows: Thursday, July 16—The management of contagious diseases in New York. Dr. William Hallock Park of the New York Municipal Laboratory; Friday, July 17—What the Charity Worker Should Know of the Treatment and Prevention of Tuberculosis. S. A. Knopf, M.D., New York; Saturday, July 18—Social Factors in the Prevalence of Consumption. Miss Lilian Brandt, statistician of the Committee on the Prevention of Tuberculosis, Charity Organization Society; Monday, July 20—The Problem of Caring for Children in Institutions. Mr. R. R. Reeder, superintendent of the New York Orphan Asylum. This subject naturally falls in the preceding section, but it is treated at this time because Mr. Reeder cannot be present on the earlier date; Tuesday, July 21—If the conditions permit, Dr. Alvah Doty, health officer of the Port of New York, will take the members of the school to visit the quarantine station and explain its work.

**A New Hospital Opened.**—Commissioner Folks of the Department of Public Charities announces that he has opened on Blackwell's Island a new hospital for convalescent patients under the jurisdiction of his department. "The object of the Hospital for Convalescents," he says, "is to aid patients in their quick recovery. It is the purpose to admit patients who can be brought back to a useful life by a few weeks of rest with healthful surroundings, good treatment, and nourishing food. Chronic, contagious, and incurable diseases will not be received. Patients will ordinarily be allowed to remain for a period not exceeding three weeks, but special cases may remain six weeks if approved by the resident chief of staff. Heretofore, there has been no public institution of this kind in New York city, and the result has been that frequently patients, after an acute disease or surgical operation, were forced to leave the city hospitals, to provide room for emergency cases, in a state that often produced great injury to themselves. The need for such a hospital has been strongly urged by charitable societies and philanthropists for some years. The hospital is in the building formerly occupied by the Manhattan State Hospital, now the property of the Metropolitan Hospital on Blackwell's Island. It has been altered and repaired at a cost of $17,500, to fit it for its present use. It is situated on the northern end of Blackwell's Island, facing the grounds of the Metropolitan Hospital on one side and the East River on its rear. The present capacity is 40 beds for men and 30 for women. It will be increased as needed to about 70 beds for men and 60 for women."

### PHILADELPHIA.

**Dr. Gibbon on Pennsylvania Hospital Staff.**—The vacancy on the surgical staff of the Pennsylvania Hospital caused by the death of Dr. Thomas G. Morton has been filled by the appointment of Dr. John H. Gibbon. The appointment was made from among a dozen of surgeons applying for the position. Dr. Gibbon was last year elected professor of surgery at the Philadelphia Polyclinic.

**Change in the Board of Health.**—The places of two of the lay members of the Board of Health have been filled, as their terms expired, by the appointment of Dr. Charles B. Penrose and Dr. Leonard Pearson. Dr. Penrose was formerly a professor at the University of Pennsylvania and Dr. Pearson is at the head of the Veterinary Department of that institution. The appointments are in line with other actions of Director Martin who is surrounding himself with advisors and assistants who are especially adapted to fill their positions.

**Dr. Pearce Goes to Albany.**—Dr. R. M. Pearce, Assistant in the Pathological Department of the University of Pennsylvania, has been elected Professor of Pathology in the Albany Medical College and Director of the Bender Institute of Pathology, Albany, N. Y. Dr. Pearce will have as assistants Dr. E. M. Stanton of New York and Dr. Charles K. Winne of Mount Wilson, Md.

**Paid Medical Inspectors a Possibility.**—Representatives of the Public Education Association have petitioned Director Martin for a corps of paid medical inspectors of public schools. Dr. Martin is in thorough accord with the plan, and is in favor of an appropriation of $100,000 for the employment of 130 inspectors at a salary of $75 for each school month of the year. The volunteer force from January to September of last year discovered 3,446 cases of contagious diseases and 2,430 cases of non-contagious diseases among the school children of the city, but it is believed that much better work would be done under a system of paid inspection.

**Dentists Sentenced for Conspiracy.**—George C. Courtright, President of the Alba Dental Company, has been sentenced to one year and Dr. William Powell, manager, to three months' imprisonment,

because of conspiracy to defraud. A dental student employed by the firm, broke the jaw of a person applying for treatment, and suit was brought against the company for employing unregistered assistants. Courtright, although not a graduate of any dental college, admitted that he was called "Doctor" by his employes and had the professional title printed on his cards. It is said that several prominent dentists and the faculties of local dental colleges were also interested in the prosecution.

**Hospital Plans Halted.**—Work on the proposed buildings for the indigent and the insane of Philadelphia has been ordered suspended. If Councils approve the plans of the new Director, larger sites, distinct from each other, will be sought probably in Bucks and Montgomery counties. As planned at first the buildings have together only 100 acres. The projected buildings will have from 600 to 1,000 acres each as grounds and the buildings will be planned so that they may be added to from time to time. The new plans have in view the outdoor recreation and employment of the inmates of the institution.

**Pennsylvania University Selects Dr. A. J. Smith for Professor of Pathology.**—The Trustees of the University of Pennsylvania, at their meeting last Wednesday, unanimously chose Dr. Allen J. Smith, of the University of Texas, to be professor of pathology to fill the vacancy caused by the resignation of Prof. Simon D. Flexner, who goes to the Rockefeller Institute for the study of bacteriology in New York. Dr. Smith is professor of pathology in the Medical Department of the Texas University and is also Dean of the Medical Department.

**Preparatory Course for Nurses.**—At the solicitation of Dr. S. Weir Mitchell and the superintendents of the leading nurses' training schools in Philadelphia, the Drexel Institute has undertaken to organize a Preparatory Course of Instruction for Nurses, under most competent instructors. Fee is $30 per term, there being two terms in the year, beginning respectively, September, 1903, and February, 1904.

## CHICAGO.

**Enforce the New Milk Ordinance.**—The passage of the new milk ordinance, which embodies stringent regulations for insuring pure milk for Chicago, marks an important extension of the health bureau's authority over the milk supply. The Health Department has been greatly hampered by lack of funds and uncertain milk supply. The inspection has been inadequate, and much impure and adulterated milk has been marketed in the city. The greatest imposition upon the poor was the sale of "skimmed milk" as whole milk, a traffic that yielded large profits to dealers. Tempted by the lower prices, the poor purchased it in ignorance of the fact that it was not only absolutely lacking in nourishment, but that it gradually starved babies fed upon it into disease. As milk is the staple article of food for the young as well as for many classes of invalids, its purity is a matter vitally related to the public health.

**Nathan Straus Pasteurizing Plant.**—Nathan Straus arrived in Chicago a few days ago to supervise the work of installing the Pasteurizing plant which he has donated to the Children's Hospital Society of Chicago. Work on the plant is progressing so rapidly that the distribution of milk probably will be begun within a week. Fifteen branch stations will be established, and many thousands of families will be supplied from them. Circulars have been sent out explaining the enterprise, and the milk commission of the society is seeking contributions of $5,000 to carry on the work.

**Nurses Graduate.**—Eighteen nurses graduated from Mercy Hospital Training School June 30. Professor N. S. Davis, Jr., addressed the graduating class.

**Reopening of Lincoln Park Sanitarium for Sick Babies.**—This Sanitarium has just begun its seventeenth successive season. During the fifty-nine days in which the Sanitarium was open in 1902, more than 35,300 children and 45,440 visitors were received at the institution. Of the children, 7,249 were sick babies, attended by mothers, who in many cases were quite as ill and helpless as the little ones. Persistent course treatment was administered to 1,690 sick children.

**Mortality Statistics.**—Notwithstanding the favorable showing of general mortality, the deaths from contagious diseases of childhood—notably diphtheria—remain distressingly high. The steadily increasing mortality of diphtheria is nothing short of a reproach to the medical profession. The value of antitoxin, both as a curative and as a preventive, has been demonstrated as no other medicinal agent ever has. And yet within the week the death is reported of the wife of a physician after but a few days' illness of diphtheria. The doctor himself was also stricken. Antitoxin, in full strength and quantity, never yet failed to cure a case of diphtheria when administered on the first day of the disease, and but rarely when on the second or third days. Just as certainly, when administered within even three days after exposure to a case, it will prevent contracting the deadly disease. In every case of suspicious sore throat, antitoxin should be given at once and in large amount. It can do no possible harm if the disease should prove not to be diphtheria; it will save life in 99 cases out of a hundred, if it be diphtheria.

## GENERAL.

**Alcoholism in Belgium.**—Recent investigations show that there is one liquor saloon to every 36 inhabitants in Belgium; this proportion outnumbering that of France where it is one to 75 inhabitants, England 1 to 82, Prussia 1 to 100, Austria 1 to 200 and Russia 1 to 991.

**The Fifth International Congress of Dermatology.** This Congress will be held in Berlin September 13 to 17, 1904. Subjects for discussion will be: (1) Syphilitic Affections of the Circulatory System. (2) Cutaneous Affections and Their Relation to Disorders of Nutrition. (3) Epithelioma and Its Treatment.

**The Special Senses of Animals.**—Dr. Werner, of Vienna, has lately printed the results of his observations upon the special senses of animals, especially upon the senses of reptiles and amphibians. He concludes that these latter are capable of going directly toward water, which attracts them, so to say, even at long distances. Light acts upon them, independently of heat. In winter they quit warm lairs to go to sunlight. Their sight is generally good and is probably their most acute sense; yet their vision is very limited. Crocodiles cannot distinguish a man at distances above ten times their length. Fish see for only short distances. The vision of serpents is poor. The boa-constrictor, for example, can see no further than a third of its own length. Some snakes see no further than one-eighth of their length. Frogs are better endowed and see twenty times their length. The hearing of all these animals is even worse than their sight. Most rep-

tiles are deaf, especially boa-constrictors. "Deaf as an adder" may represent a careful observation of our ancestors.

**Tuberculosis Sanatorium.**—Dr. F. M. Pottenger is building a sanatorium for tuberculous patients at Monrovia, California, sixteen miles east of Los Angeles at the foot of the Sierra Madre mountains. The site of the sanatorium is on an elevation above the town at an altitude of about one thousand feet. All of the rooms will face south, and from them can be obtained a view of the San Gabriel Valley for nearly fifty miles with Catalina Island, sixty miles away, plainly visible on clear days. The capacity of the institution will be about fifty patients, only the administration building, with a few rooms, will be built this summer.

**Regulation Affecting Post-Office Physicians.**—Postmaster-General Payne on July 1 issued an order abolishing the position of physician in post offices at the close of business June 30, 1903. This order wipes out a small list of officials whose employment without specific authority of law has caused wide discussion in connection with the Post Office investigation. Some of these offices paid $1,700 a year. The post offices employing physicians up to the close of the fiscal year, when the Postmaster General's order took effect, are New York, Chicago, Brooklyn, Philadelphia, and Boston.

**Obituary.**—Dr. Charles Lancaster, ninety-five years old, a well-known physician, lawyer and literary man, died last week in Plainfield, N. J. He was born in East Winthrop, Me., and early in life was intimately acquainted with Emerson and Longfellow. He was a talented writer, and entered the medical profession and practised for many years. He was the author of many newspaper and magazine articles and wrote several text-books. He lived at one time in Philadelphia and came to Plainfield in 1895.

## CORRESPONDENCE.

### OUR LONDON LETTER.

(From Our Special Correspondent.)

London, June 27.

BIRTHDAY HONORS—THE ROYAL FAMILY AND THE MEDICAL PROFESSION—RETIREMENT OF SIR FREDERICK TREVES.

The list of "Birthday Honors," as they are called, which was published yesterday contains the names of several members of the medical profession. By far the most distinguished of them is Dr. Manson, whose name is so closely and so honorably associated with the establishment of the mosquito theory of malaria. He is now "Sir Patrick" and his wife is transfigured into Lady Manson. Manson has not only been a pioneer in research, but he has been the initiator of the movement in this country for the special study of tropical diseases. The London School of Tropical Medicine is his creation. He is Medical Adviser to the Colonial Office, and he has used the opportunities afforded by his position to impress on Mr. Chamberlain the vast importance, from the point of view of the expansion of the Empire, of finding means to protect colonists against tropical diseases. This is frankly acknowledged by Mr. Chamberlain himself in a parliamentary paper recently issued, in which the work done by the Schools of London and Liverpool and by scientific expeditions sent out to West Africa, the West Indies and elsewhere, is set forth in detail. Manson's work entitles him to the gratitude of the human race, but he would have had long to wait for recognition had he not held an important office under a statesman whose influence is paramount.

Another physician who exchanges the title of "Dr." for that of "Sir" is Stephen Mackenzie, a younger brother of Sir Morell Mackenzie, whose attendance on the Emperor Frederick has made him a historic character. Sir Stephen Mackenzie is an excellent all-round physician who has never stooped to court the favor of the public by any kind of advertisement. The unpopularity of his brother, to whom he was under great obligations, made his path particularly arduous, but he conquered by sheer straightforwardness. He is the senior physician to the London Hospital, an institution which has of late basked in the sunshine of royal favor. This is partly due to the interest taken by the Queen in the light treatment introduced by her countryman, Finsen. The London Hospital was the first in this country to make provision for the application of this method, and the Queen presented it with some lamps for the purpose. Adroit use has been made of this act of royal beneficence by the Chairman of Governors, Mr. Sydney Holland, himself the grandson of a well-known physician, Sir Henry Holland, who married the daughter of Sydney Smith; and the London Hospital is reaping the reward of clever appeals to the instinct which is strongest in the British breast—that of loyalty.

Knighthoods are also conferred on Mr. A. D. Fripp, who found fame and fortune in a wound made on the person of a princeling by a poisoned shaft from Cupid's bow; on Dr. Perry of Guy's Hospital, who is the leading spirit on the Advisory Board of the Army Medical Service; and on Dr. P. Heron Watson, Surgeon to the King in Scotland. A number of decorations also fall to the share of senior medical officers of the Army. There is no name of any special distinction among them; they are like *fortisque Gyas fortisque Cloanthus* among the followers of Æneas.

The King, who is an Honorary Fellow of the College of Physicians and Surgeons, is fairly orthodox in his medical belief. Even before his attack of appendicitis he took an interest in that important department of surgery which takes not the vermiform, but another appendix, for its province. At any rate he has been known to criticize with severity the treatment adopted by eminent surgeons of certain disorders which, *consule Planco*, were rather common among the noble lords who deemed it a privilege to be his lackeys. But in medicine the Queen has a distinct leaning to heretical doctrines. Some time ago when a few homeopaths were getting up a memorial to one of the number, Mrs. Clarke, the wife of Dr. John H. Clarke, editor of *The Homeopathic World*, asked for a subscription from Her Most Gracious Majesty, on the ground that "Mrs. Clarke believes that Her Majesty has taken an interest in homeopathic practice and trusts that the foundation of the British Homeopathic Association, under the presidency of Earl Cawdor, for establishing a School of Homeopathy, so much needed in London, will meet with Her Majesty's sympathy." Whether it did so or not, I am unable to say. The Queen's name does not figure in the subscription list, but an awkward situation would be produced if the Queen went out of her way to express publicly her sympathy with an unimportant sect. The position is somewhat akin to that of Lord Chancellor Thurlow when he was asked by some Noncomformist divines to remove the disabilities under which they then labored. He replied, "Gentlemen, I can do nothing for you. The Church of England is established by law in this country. You get your d—d religion established and I will do anything you like." Orthodox medicine is "established" in this country and medical noncomformity cannot, therefore, be openly recognized by royalty. As an illustration of their position I may mention that

it is perfectly well known that they one and all cordially detest vivisection, but they do not dare to say so.

In connection with the relations of the royal family to medicine and its professors, I may take this opportunity of pointing out that a story told in your columns, in the issue of March 28, about Sir Richard Douglas Powell, is quite a curiosity of inaccuracy. That eminent physician who is said to be "well known for his bluntness" is represented as speaking with remarkable plainness to the King and as replying to the remonstrances of Sir Francis Laking with a declaration that if there was to be any "squirming" Laking must do it. Laking is indeed a first class "squirmer" and is known among his friends as the "Medical diplomat." But Douglas Powell is the very opposite of blunt; he has the bland unctuousness of manner as he has the solemn appearance of an ecclesiastical dignitary. He takes himself and everything that he does very seriously indeed. He talks like Sir Oracle, whom no dog's bark should be suffered to interrupt. The stories related of him by your contributor would fit the late Sir William Jenner who, though trusted by Queen Victoria, was disliked by the present King for his plainness of speech. But Sir Richard Douglas Powell would think it blasphemy to be accused of the language put into his mouth.

Sir Frederick Treves has just intimated his intention of retiring from practice at the end of July, that is, at the end of the London season. He is a man in the prime of life and in full vigor of mind and body; he is also at the highest point of what economists would call his productiveness. His determination has therefore caused no little surprise among his professional brethren, though I have no doubt it will be highly approved by those of them who make a specialty of abdominal surgery. I do not know what may be the true inwardness of the retirement of the most successful surgeon in Great Britain at the very height of his popularity. It is not ill-health, for he means to continue his work as a member of the Advisory Board of the Army Medical Service. It is probably a natural desire for rest after twenty-five years of exceptionally exacting work. Few men have worked harder than Treves. Last week he performed ten abdominal sections, and I have been told by one who knows him well that since the operation on the King he has been so overwhelmed by the crowd of patients that there have been days when, if he had had the time, he might have done fifteen operations between sunrise and sundown. He has, of course, made a considerable "pile," and he has no family now depending on him, one of his daughters having died soon after his return from South Africa, while the other was married within a week or two of the historic operation at Buckingham Palace. It has been said that he has an ambition to win fresh distinction in political life, but this he positively denies. It is tolerably certain, however, that he will be heard of again. His retirement may turn out to be like that of Gladstone who, after playing Cincinnatus for a few years, came from his cabbage garden to take the head of his party. It is at any rate to be hoped that Treves will, for the benefit of science and mankind, gather the fruits of his unrivaled experience into permanent shape.

**The Bactericidal Action of Human Blood-Serum.**—Experiments conducted with the blood serum of healthy human subjects have been made by E. LOWENSTEIN (Deut. Archiv f. klin. Med., Vol. 76, Nos. 1-3), in order to determine not only the actual bactericidal properties, but also whether there is any relation between this property and the course and severity of the disease. It was found that the serum of adults possesses strong bactericidal action when directed against typhoid bacilli and cholera vibrios, but only a weak action against anthrax.

## SOCIETY PROCEEDINGS.

### NEW YORK ACADEMY OF MEDICINE.

SECTION ON GENITO-URINARY SURGERY.

*Stated Meeting, held April 15, 1903.*

John Van der Poel, M.D., Chairman.

**Gumma of the Lip.**—Dr. James Pedersen gave the history of a man, twenty-three years old, a cook by occupation, who was admitted to the hospital with an extensive ulceration involving the left half of the upper lip, extending into the mouth at the angle for some distance, and having a copious, fetid, purulent discharge.

Fig. 1.

Appearance on admission to the hospital.

It was a very unsightly condition. The absence of induration and of inflammatory thickening was marked. He was first admitted to Dr. Bryant's service with a tentative diagnosis of epithelioma; but was transferred to Dr. Bang's service and came under Dr. Pedersen's care. A history of an initial lesion eight months before was obtained. He was at once placed under antisyphilitic treatment. Later he was presented before two clinical societies; the diagnosis of epithelioma was made by some notwithstanding that the condition had

Fig. 2.

Gumma of the lip: after about two weeks of treatment.

improved under mercury and iodide of potash. Tuberculosis was easily excluded. Treatment by hypodermatic injections of mercury and increasing doses of iodide of potash had been followed by good results, improvement continuing progressively. When the patient left the hospital there remained only a small unhealed surface. The patient reported at his office once or twice after that. Dr. Pedersen thought it interesting to note that, in spite of the large ulcerating surface originally,

the resulting scar was not very perceptible and the deformity but trifling.

**Cyst of the Sheath of the Penis.**—Dr. James Pedersen related the history of a man who was admitted to the hospital in November, 1902, with the following history: He had had no venereal disease. About eight months before admission he had been struck on the left side of the penis by a baseball. The spot became painful but no swelling occurred until two months after the receipt of the blow; this swelling was dark-blue in color and not very painful. The patient squeezed it vigorously on several occasions in attempting to force the contents out. Finally he succeeded, the rupture taking place at the free border of the prepuce. A thick dark brown material was discharged. The sac soon refilled. One month prior to coming to the hospital, a physician made a small incision at the summit of the swelling. A discharge of pus was said to have occurred. Examination showed a firm ovoid mass apparently attached to the corpus cavernosum having, at its summit,

Fig. 3.

Cyst of sheath of penis.

a crater-like depression, where the small incision had been made. During the succeeding night the sac ruptured at this point and the contents were lost in the dressings. In consequence, at the time of operation, the mass was found considerably reduced in size. The probable nature of the contents was not recorded. An elliptical incision was made and the sac everywhere carefully dissected out and trimmed off down to its floor, which seemed to blend with the fibrous sheath of the corpus cavernosum. No attempt was made to remove the floor because of the risk of producing a contracting scar in the sheath of the corpus cavernosum. The floor was thoroughly scraped with a sharp curette and the skin brought together over it. Primary union was obtained except at one angle from which a scanty serous discharge took place until after a few injections of a stimulating silver nitrate solution. When last seen the patient said erections occurred without pain or curvature and that he could now cohabit with comfort. His chief complaint has been that because of the mass he had not been able to cohabit. The walls of the sac, which were about one-eighth of an inch thick, were examined and found to consist of dense fibrous tissue.

**An Unusual Case of Peri-urethral Abscess.**—Dr. Howard Lilienthal presented this patient, a man, thirty years old, who had been sent to his service at the Mt. Sinai Hospital February 22. When he entered the hospital his principal complaint was pain and induration in the testicle. His family history was negative. He had gonorrhea eight years ago and this was accompanied with joint swelling and other symptoms for two months and an intercurrent attack of pneumonia. He had a gonorrheal discharge for seven months and then it ceased. His present illness began with his second attack of gonorrhea which he had last February. Three weeks before admission he noticed a swelling in the midline of the penoscrotal junction which was hot and tender. He had also a certain amount of chordee. One week before the operation he had this abscess incised by Dr. Goldenberg. A careful examination of the pus by culture and spread showed it to be sterile. On admission his purulent discharge from the urethra did not contain gonococci. The mass at the penoscrotal junction was indurated, and was about 5 cm. in diameter extending to the left side. At its center was a sinus through which a probe could be passed for a distance of about six or seven inches upward into the left groin. No organisms could be found by culture or spread from the discharge from the sinus. The upper pole of the epididymis was tender and enlarged. The inguinal glands on the left side were more enlarged and tender than on the right. Operation was performed on November 28. This patient had been thought to be tuberculous and had been given an iodoform-glycerine emulsion by injections which did him no good. The reason he was thought to have tuberculosis was because no findings by culture or spread were obtained. He opened the left tunica vaginalis but he did not find it necessary to go far up into the groin because the channel had partly closed. He had great difficulty in tracing the pus to its source but finally succeeded after a very extensive operation: it was in the neighborhood of the urethra near the penoscrotal junction. By the aid of retractors he opened down to the bottom and scraped it out thoroughly and packed it with iodoform gauze. A very amusing incident occurred at the time of operation. There were a great many indurated masses in the tract and, wondering what the disease was, the doctor excised some of the yellow granular deposits with the idea that the case might be one of actinomycosis. When he recalled the injections of iodoform-glycerine emulsions these deposits were explained. There was so much of the tunica vaginalis involved that he removed the thickened portion and left the testicle pretty well uncovered. It was noted that on March 18 the discharge from the urethra continued but no organisms were found in it. On April 2 the sinus was curetted and packed with iodoform gauze. April 10 there was no discharge from the urethra although the patient was still receiving urethral irrigations. The patient was in the hospital at present being treated for a small sinus which persists and may have to be again curetted.

Dr. Ferd. C. Valentine asked if it was Dr. Lilienthal's experience, dealing with peri-urethral abscesses to have fistulæ remain, especially in those cases which resulted from breaking down of infiltrated glands. At present he had several such cases. In these he used the Kollmann galvanocaustic needle to destroy the cicatricial tissue which lined the fistulæ; adhesions then formed and no disagreeable results supervened. He referred only to those smaller fistulæ which connect with the urethra and whose extent was too small to warrant plastic operation.

Dr. F. Tilden Brown asked Dr. Lilienthal where the starting point of this sinus was situated and also what was the probable etiology of the condition.

Dr. Howard Lilienthal said that he had seen fistulæ which were said to be the result of peri-urethral abscesses and he had operated upon them, but it had been his fortune thus far not to have had fistula result in any case that he had operated upon. Still they continued to come into the hospital with fistulæ. Rather than to evacuate the abscess into the urethra he thought it better to open it early from the outside for the reason that these fistulæ occur on account of the necrosis of a considerable part of the mucous membrane of the urethra itself and these fistulæ were more likely to occur if you allowed them to break spontaneously into the urethra. He advised operating from without so soon as you are sure that you are dealing with a peri-urethral abscess. Of course there will be a minute opening between the urethra and the abscess cavity but that will take care of itself.

He said that the origin of this abscess was at the penoscrotal junction and originated in all probability from a peri-urethral abscess gonorrheal in character.

Dr. John Van der Poel said that in five or six cases of peri-urethral abscess he had been unable to find gonococci or other bacteria in the pus. In each of these instances by means of the endoscope he had been unable to find any trace of an urethral opening to the abscess, but in other cases when there was a urethral sinus, gonococci had been found in the pus passed from the abscess cavity into the urethra, and collected in the endoscopic tube.

**Rupture of the Urethra.**—Dr. J. A. Bodine reported the history of a man, fifty-six years old, who had sustained subcutaneous rupture of the urethra as the result of falling astride an iron beam. He felt dazed for a time, but resumed his work. He noticed moisture at the meatus and on examination found blood issuing. He went to Long Island City and called his physician. There was no desire to pass water, although the patient was sure he had not urinated since early in the morning. His physician wisely attempted no instrumentation except to pass a soft catheter which stopped at the membranous urethra. Patient was sent into St. John's Hospital the evening of the same day and operated upon eleven hours after the accident. Blood was flowing from the meatus and a scrotal hematoma the size of a fetal head existed. The perineum was distended, fluctuant and ecchymotic. A sound introduced through the meatus was arrested in the membranous urethra, its tip lying just under the skin of the perineum. Incision through the skin showed the muscles to be extensively lacerated and torn. There was considerable active bleeding, which was easily controlled. No infiltration of urine had occurred, though the bladder was very much extended. There was no deep urethra present. A finger could be passed directly up to the subpubic arch. The torn proximal end could not be readily found, though little time was spent in its search as the distended bladder above the pubes offered such an easy and rapid method of identification by a suprapubic puncture and retrograde catheterization. The segments of torn urethra were identified, and as they could be approximated without tension, were sewn together around a soft catheter, introduced through the meatus. The perineal wound in the muscles was left open and packed with gauze. The suprapubic wound was sutured, both the bladder and abdominal wall, except its lower angle, through which issued a silk thread the other end passing through the eye and lumen of the catheter out of the meatus. The bladder was drained through the urethra for ten days. Daily withdrawal, sterilization and reinsertion of catheter being practised. Primary union of urethra occurred and the patient left the hospital in four weeks. No leakage of urine through perineal wound could be detected. A No. 30 French sound passes without any inconvenience, the urinary and sexual functions were perfect. The inducement to do suture of the entire circumference of the urethra around the catheter in an effort to secure primary union were the absence of any urinary extravasation in the perineum and the lack of tension when the torn urethra was approximated. He emphasized the value of suprapubic puncture with retrograde catheterization as the easiest and quickest method of identifying the proximal end of the torn urethra.

Dr. Howard Lilienthal believed that the suprapubic operation was the only thing to do in such a case. He had seen valuable time wasted in attempts to reach the posterior urethra when it could be readily managed by making a suprapubic opening. He thought Dr. Bodine would have taken fewer chances had he drained the bladder through the suprapubic wound.

Dr. F. Tilden Brown reported a case seen two weeks ago which demonstrated the utility of the suprapubic opening. During the operation he wished to have a leading thread in order that he might introduce a larger catheter. After he had made his suprapubic incision a soft catheter was passed through the proximal section of the urethra; the distal or eye-end of the catheter in the bladder had passed over it a loop of silk. He expected to use this silk thread to bring a larger catheter in. This was deemed important because of the existence of a tight stricture in the anterior urethra and because the rupture was the result of the necrotic state of the membranous urethra secondary to extravasation of urine; there were present numerous fistulous tracts also. This man passed his urine through the perineal opening and since operation he has been able, by the aid of vision and touch, to pass a sound into the posterior urethra. The first time he attempted this the vesical end was well out of sight and it was difficult to see whether the point of the sound traveled the proper course. To act as a safeguard he passed a curved catheter into the perineum.

Dr. Pedersen said that formerly much damage had been done by overzealous attempts to pass a catheter. It was reassuring to note that a better understanding of these cases was becoming established among practitioners in general. In these cases the urethra should not be explored until preparations for operating had been completed, and the operation should be undertaken as soon as possible.

Dr. J. A. Bodine said that the suprapubic wound was closed by suture, except its lower angle. The attachment of a silk string to the end of the catheter in the bladder bringing the other end of string out of the open lower angle of suprapubic wound insured an easy and safe reinsertion when the catheter was withdrawn for sterilization. He asked the members present if they frequently had delirium associated with suprapubic operations on the bladder. Delirium followed in this case and he thought it was due to absorption of urine through the wounded surfaces, though the wounds were clean and there was no escape of urine through the perineal section. The quantity of urine and percentage of urea were normal. It had been his experience that delirium followed the suprapubic incision into the bladder in many cases. He recalled this annoying symptom in four prostatic operations where the incision had been made above the pubes.

Dr. Howard Lilienthal said he had performed many suprapubic operations for various reasons and had had only one case in which delirium occurred; this patient

had a severe hemorrhage and was septic and it was natural that delirium should follow. He had seen two cases of delirium following the suprapubic operation for stone. One terminated fatally, the other not. He could not explain the delirium occurring in Dr. Bodine's cases. He believed the suprapubic operation to be simpler than the perineal.

Regarding the thread he used silk thread that had been been dipped in compound tincture of benzoin; this made it not only aseptic but holds knots fast as well as rosin would.

Dr. F. Tilden Brown believed that it would have been a mistake to use an unreasonable ligature material in this patient because, unless the parts were kept open, the silk ligature would serve for granulations to grow upon. He preferred chromicized catgut to silk.

Dr. John Van der Poel said he had seen one case of delirium following suprapubic operation for stone. In this case there was a purulent bronchitis and considerable temperature following the use of ether. The delirium abated with the subsidence of the bronchitis and its accompanying fever.

Dr. F. Tilden Brown said that he believed a person could have a low grade cystitis following a urethritis contracted some time prior to the suprapubic operation, without any micro-organisms being present except those that were considered to be normal, and without any urinary symptoms at all. In such an instance he would not be surprised to find, upon opening into the cellular tissues about the bladder, some evidences of constitutional disturbance due to absorption, not of high grade, but a low septic process.

**The Treatment of Acute and Subacute Anterior Gonorrhea by Retrograde Injections of Stronger Solutions of Silver.**—Dr. Hermann G. Klotz read this paper. The principal features of this paper were published last summer in Vol. LXII of the *Archiv für Dermatologie*. From previous experiences with irrigation of the anterior urethra with solutions of bichloride of mercury, nitrate of silver, permanganate of potassium, etc., he had become convinced that the mucous membrane showed much less irritation subjective and objective when such solutions were allowed to flow through the urethra in a retrograde direction, that is, from the bulbus to the meatus, than when administered in the contrary direction from the meatus to the bulbus. The syringe he used for his injections was a somewhat enlarged edition of the old Braun's intra-uterine syringe; the opening in the tube was located in the side of a bulb at the end of the syringe, so that the fluid was not easily projected beyond this point of the syringe itself. Lubricated with the injection fluid (protargol, argonin, albargin) or some other lubricant, the point of the tube was carefully inserted within the orifice and quickly passed down to the bulbus, when the syringe was slowly emptied of its contents. The fluid was retained within the canal for two minutes or more. Eight or ten hours after the injection the patient should begin injections of some of the common antiseptics or astringent solutions. After four or five days the silver injections should be repeated and, at this time, the condition of the urethra warrants a stronger solution. Treatment was continued in this manner until the discharge disappeared when all injections were finally discontinued. Toward the end of the injections the test with beer or whisky was allowed. Whenever after a reasonable number of injections a cure or decided improvement had not been effected, an endoscopic examination would usually reveal some local condition which would explain the persistence of the trouble and require stronger local remedies. He next considered the question, under what conditions a gonorrhea might be considered cured. He believed that a cure should be conceded if the discharge and gonococci had entirely disappeared and did not return after all treatment had been discontinued for several weeks and the patient had resumed his usual mode of living, particularly in regard to sexual intercourse and alcoholic habits. As a symptom of the greatest importance he closely watched for the disappearance of every trace of cloudiness from the first portion of the urine, particularly of the morning urine even though some threads or filaments might remain. He did not think it was possible in all cases to remove these threads; the efforts to accomplish this object often did more harm than good, he did not believe the presence of these filaments were in the least injurious to the men themselves nor to the women with whom they had sexual intercourse, even though there be present a small number of pus cells beside epithelia, provided there were no gonococci found on repeated examinations.

From a previous experience in subacute cases he was ready to follow Von Sehlen's example, adopting his principles, but with some modifications. Instead of using the ordinary syringe he employed the one above referred to, so as to place the silver solution as far as possible beyond the infected region of the urethra, in recently infected cases about three inches from the meatus, in the more advanced ones as far as the bulbus. He did not think there was danger of carrying active gonococci into the deeper portions of the urethra. After removing the syringe he followed Von Sehlen's method. He first used solutions of nitrate of silver from one-tenth, later usually one-eighth per cent. and higher concentrations. Where the inflammation was very intense and the mucous membrane very sensitive he occasionally resorted to thallin in seven per cent solution. Of the various organic silver preparations he had had experience with argonin, protargol, less so with ichthargan and argentamin. Since 1901 he had become very well satisfied with albargin, and later experience had confirmed the favorable opinion of this drug, which was expressed in a paper published last fall (MEDICAL NEWS, Nov. 29, 1902). Argonin had been employed up to 10 per cent., protargol 2 per cent. to 4 per cent., albargin 1 per cent. to 5 per cent., ichthargan up to 2 per cent., argentamin (more in the later stages) from 5 per cent. to 10 per cent. equal to one-half per cent. to 1 per cent. nitrate of silver. He said that all the newer remedies caused an increase in inflammation and secretion, furnishing a more favorable condition for the development of the gonococci: therefore, he deemed it advisable to use some gonococcidal injection only at stated intervals to avoid cumulative irritation; in the interval, he administered astringent and antiseptic solutions, and the following was his favorite, and which he designated briefly as the B.P.Z. Injection:

| | | |
|---|---|---|
| ℞ Boric acid ..... | 1.5 | grams (24 grains). |
| Acetate of lead, | | |
| Sulphate of zinc, of | | |
| each ..... | 75 | centigrams (12 grains). |
| Glycerin ..... | 4 | grams (1 dram). |
| Water ..... | 120 | grams (4 ounces). |

M.S.

In general his experience had been that cases of gonorrhea which came under treatment soon after infection and immediately upon the appearance of the symptoms, were permanently cured within a few, six to eight, days. In other cases he did not succeed in removing the cocci, but the symptoms were quickly reduced to such a degree that the patients hardly experienced any trouble except that immediately connected with the treatment, and all graver complications were

avoided. The earlier the treatment was begun the more successful would it be. When a patient presented himself for treatment on the appearance of the first symptom, say four to seven days after infection in primary cases, thirty-six hours to three or four days in reinfected ones, after emptying the bladder, an injection of some silver solution is immediately made in the concentrations of one-eighth to one-fourth per cent. of the nitrate of silver, 2 per cent. of protargol, 1 per cent. of albargin, etc. This was deposited three or four inches from the meatus. A second injection was made of a stronger solution if the first did not cause any burning. After removing the syringe the fluid was so manipulated that it was distributed as much as possible over the mucous membrane. If the patient called in the morning he was advised to take the B.P.Z. solution before his evening meal and at bedtime. The next morning he received his second injection of silver and again on the third day, the B.P.Z. injections being repeated as on the first day. On the fourth day the astringent injections were repeated three times, on the fifth was given a silver injection, then the B.P.Z. injections were continued for forty-eight hours and, on the eighth day, after twenty-four hours' intermission of all treatment, another silver injection was made. Should the symptoms continue after the seventh or eighth day the silver injections should be continued at intervals of three or four days, as in the subacute cases. In the later stages he preferred nitrate of silver to the organic silver preparations.

Dr. George K. Swinburne said that he was almost entirely in accord with all that had been stated by the reader of the paper. Any one who had treated this disease must work out his own method. He had used in the past retrojections, but he now preferred other methods. He was glad to hear Dr. Klotz say what he did regarding the threads occurring in the urine in these patients; many of these individuals spend their entire time examining their own urine looking for these flakes, which they consider to be the disease itself. These flakes could be proven to be non-contagious. One could make the urine clear up after a week or ten days, but these threads would very soon return.

He said he had been for many years now observing the effects of treatment in cases of acute gonorrhea, more so than in the chronic cases. He first began in 1888 with Dr. Brewer, and learned his method of hot retrojections of bichloride at the Vanderbilt Clinic. When he came to have a clinic of his own he started in to study the disease itself, giving patients placebos. In order to make his studies complete, and to learn the value of internal medication, every other patient received some supposedly antigonorrheic mixture, the alternate patient receiving the placebo. The results obtained in both treatments were practically alike. In some cases the discharge ceased, after a longer or shorter time; in others it went on to a chronic condition. Before this he had found that, in using ordinary urethral irrigation of bichloride, the bladder could be irrigated from the meatus without a catheter; this was in 1888. Then he made further studies, stopping all internal medication, and tried local treatment with nitrate of silver in dilute solution at first and gradually increasing them. Later the two-per-cent. solutions were tried as an abortive means, but found to be too irritating and to be especially disastrous in primary cases. He then took up the permanganate of potassium irrigations, irrigating with a fountain syringe. He then tried argonal, then protargol, albargin, and other preparations. Of late he had been using exclusively the new salt of silver, argyrol, because it was entirely non-irritating, no matter what the percentage used. There was no question regarding the valuable results he had obtained with this drug.

He had seen a large number of primary cases early in the disease, and only during the past winter forty primary cases were under his care at one time, all being primary cases of gonorrhea, and they came to him during the first week. Of this forty, twenty came within forty-eight hours, and fifteen within twenty-four hours after the beginning of symptoms.

A great many cases stop treatment when the discharge stops and remain away until the discharge returns; therefore, when they return, the disease has invaded deeper portions of the canal, the urethral follicles may be involved, abscesses may form, epididymitis may develop, etc., all due to the fact that the patients stop treatment too soon, because of their ignorance of the disease.

Dr. James Pedersen said that he was familiar with the method of treatment by retro-injections, as applied to subacute and chronic urethritis, but he preferred to call them *instillations*. He was, however, opposed to the stronger solutions of silver nitrate, fearing the after-effects which the delicate mucous membrane of the urethra must receive from a two-per-cent. silver nitrate solution. He preferred the milder solutions, although the course of treatment was thereby prolonged. He believed that the ultimate result as to a cure was as good, and that the more remote effect upon the mucous membrane would be even better than when the stronger solutions were used.

Time and again, when making an endoscopic examination of patients who had come to him suffering from chronic urethritis, he had been struck by the cicatricial appearance of the urethra in general and of the anterior two or three inches in particular. Enquiry had always developed the fact that these patients had used or had been given an irritating injection—one that had caused a subsidence of the discharge very quickly, but had given rise also to considerable burning when in contact with the urethral mucous membrane. He recently had the opportunity of inspecting a urethra which had been the seat of repeated severe attacks of urethritis. This patient had refused local treatment for some reason, and had simply treated himself on the expectant plan. Endoscopic examination showed a practically normal urethral mucous membrane. Dr. Pedersen pleaded for the use of milder solutions, even though the treatment required a longer time to effect a cure, meaning by "cure" the restoration to a condition in which the patient may be conscientiously allowed to marry.

Dr. Ferd. C. Valentine said that it was not clear to him how retrograde injections could produce less objective and subjective symptoms than those conventionally employed. Persistently advocating, as he does, the irrigation treatment of gonorrhea, it seemed to him that the entrance of fluid into the urethra and the flow therefrom, by carefully administered irrigations, could under no circumstance produce objective or subjective disturbances. It seemed to the speaker a violation of surgical principles to introduce any rigid instrument into an inflamed area, especially an area so sensitive as the urethra. The speaker further asked the author whether one of the claims he made for the instrument was not really an objection to it, namely that the fluid carried by the instrument into the urethra could not be projected beyond its acorn. This, it appeared to the speaker, would inevitably carry before that acorn the elements of disease, and would distribute them along the regions not yet infected. Dr. Valentine said that in the light of his experience whisky was by no means as reliable an irritant as beer and carbonated beverages.

with which to demonstrate the presence of gonococci in apparently cured cases. He referred, in this connection, to another one of Dr. Klotz's brilliant papers, in which the author had shown how severely irritating to the urinary apparatus the use of carbonated drinks can become. On the contrary, even the abuse of whisky does not, in the speaker's experience, exercise such an irritating influence upon the urethral mucosa as do carbonated beverages. In referring to the proofs of cure, the speaker took exception to von Zehlen's statement that if the discharge ceases and the patient resumes his usual mode of living, and had no recurrence of the discharge within three weeks, then the patient was to be considered cured. The speaker pointed out the large number of men who are apparently cured from gonorrhea, and even years later infect their wives. Dr. Valentine insisted that in no case should a physician consent to a patient's marriage until the beer-test, irritation of the urethral mucosa with injections of nitrate of silver or mercuric bichloride, interrogation of the prostate and seminal vesicles, urethroscopy, and finally the condom-test had proven him to be absolutely free, as far as modern science allows us to decide, from ability to infect with gonococci. Even then, wisdom demands repeated examinations of urine passed perfectly clear, both microscopically and by cultures to prove that the urine does not carry gonococci from some part of the genito-urinary apparatus. In speaking of the retrograde injector from its mechanical viewpoint, he could not but felicitate Dr. Klotz upon the ingenious improvements he had made in the instrument; but he insisted that a retrograde flow of whatever medicating fluid was employed, he must adhere to the far greater value and safety of irrigations, which do not entail the introduction of any instrument into the acutely inflamed urethra. Dr. Valentine agreed with Dr. Pedersen regarding the keratosis of the urethral mucosa, which is often found after strong drugs have been injected into the channel. Regarding the use of drugs in irrigations, experience had taught him to vary them, while he still placed greatest reliance upon potassium permanganate irrigation. In concluding he referred to the possibilities of there being various forms of gonococci, some yielding to irrigations with one drug, others to irrigations with other solutions.

Dr. William J. Brunner said he was impressed with the short time required to effect a cure. It seemed to him that experiences of most men were contrary to that statement. Not only in private practice, but in hospital and dispensary practice the cases ran three, four, five, six or seven weeks, and even then one could not be sure of a cure being effected. Again he believed the character of the patients under treatment had much to do with the course of the disease, *i.e.*, their mode of life had much to do with the ultimate results of treatment. It was the experience of many that the so-called cures later found their way to other doctors.

Dr. Frederic Bierhoff fully realized that so long as there were several men working along one line of work in this specialty, there would be several methods of treating the same disease. At present he adhered to the irrigation method, as opposed to the instillation and injection methods. He had not had any opportunity of using and testing the method advocated by Dr. Klotz. He agreed with the statement that the sooner we began treatment of gonorrhea the better it would be for the patient, and the greater the chances for cure. Personally, he had had some experience with the so-called abortive treatment, the treatment advocated by Frank, of Berlin, and others, and he was perfectly satisfied with it. In some instances after but one application, when the patients present themselves within twenty-four hours after the suspicious intercourse, the gonorrhea would disappear and remain away. In other cases though, that presented themselves within a few days after the suspicious intercourse, the gonococci have disappeared after one application of the irrigation treatment advocated by Levine, the gonococci remained absent and the patients had been absolutely free from any discharge within forty-eight or seventy-two hours, and remained so even after the most rigid tests. In cases of subacute gonorrhea he had obtained satisfactory results from the irrigation treatment, employing the modern gonococcicide drugs. It was his experience with the use of these drugs in gonorrhea that where the gonococci persisted after the eighth day of treatment he would have to deal with inflamed glands, with prostatic involvement, etc. In a fairly large proportion of cases with clear urine it was his experience to find gonococci in the prostatic secretion. He thought it stood to reason, where such conditions were present, that the irrigation or instillation of drugs could not be of service in curing these patients. They must be treated by different methods. If there was any danger at all, there was danger in the too great tendency to schematize. When recurrences occurred he thought it was due to insufficient treatment. If the prostate was involved, he believed it was due to a pre-existing condition of congestion of posterior urethra and prostate. The patients should be instructed that when the gonococci were removed and remained away, and the discharge had been entirely removed, if there were minute filaments present in the first urine, and they were found to be composed of mucus or fibrous shreds, with epithelia and isolated leucocytes perhaps, there was no danger whatever. If there were present, however, a large percentage of leucocytes it meant involvement of the glands and then, as a rule, the proper treatment would remove them.

Dr. Walter C. Klotz said he had employed this treatment during the past year in 200 cases of gonorrhea and, judging from the records of these cases, the results had been very satisfactory. Although the solutions used were stronger than those recommended by other authors, the patients had rarely complained of severe burning or irritation. In only 5 per cent. or 6 per cent. of all cases had inflammation extended to the posterior urethra and only a few of the latter cases developed epididymitis during the course of the treatment. The time of treatment was comparatively a short one. In some of the cases with primary attacks, the results were somewhat disappointing. In all cases the subjective symptoms were greatly relieved and the discharge much diminished.

Dr. B. Lapowski said that he knew of no one method for stopping the discharge in urethritis of specific origin. The trouble was not so much in stopping the discharge in those patients who wished to get married, but to get rid of the filaments that were present in the urine. The important point to remember was that the urine was not clear, and the question then comes up, "Are there any gonococci in that urine?" Any method that can rid these patients of the gonococci is the right method, and any method that fails in this object is the wrong method. He asked why it was impossible for us to state positively that the prostate was unaffected, and that there were no gonococci present, even in those cases in which the urine is clear? When the prostate is affected he asked how one could arrive at the conclusion that such was the case? He said we could never reach the lateral portion of the prostate for purposes of examination, because it was embedded in the rectum and, if that portion was affected there was the seat of the disease and there were the gonococci. The

prostatic epithelial cells were linked; between the prolongations of the cells the fibers and muscles go in. When the muscle contracted the cells contracted to expel the pus, but the muscles were never contracted to such a degree as to expel the gonococci which were in the cells. He related the instance of a patient, seen by him eighteen months ago, who gave no gonorrheal history. In the semen there were no spermatozoa. There was a clear discharge of fluid, which he could not tell whether it was prostatic or not. He asked for a specimen obtained after coitus. In natural coitus he said the muscles would contract nicely and press out the contents of the prostate; but when the coitus was not natural the contents would not be pressed out. This he considered to be a very important point. If such a patient married the following day often the gonococci would show themselves. He said that one should not forget the fact that there were other cocci present which looked like the gonococci and stained with Gram's stain and which were diplococci. Therefore, when one examines such a patient and finds something which looked like the gonococci and took the Gram's stain, often the conclusion was jumped at that it was gonorrheal. Some of these cocci were anaerobic and others aerobic.

He did not believe, as had been stated, that there were different kinds of gonococci, although they might act differently. One might be grown by agar-agar cultures and another might grow upon serum cultures. If a gonococcus be taken which had no vitality and placed in agar-agar serum for a long time, we may get a plain culture. A gonococcus may be had from a woman which has no vitality; and when transplanted to new soil it may develop. He believed that if we left the patients alone, only tending to the cleansing and keeping the parts at rest, we may hope that Nature itself will do something for the gonococci without our further help.

Dr. T. M. Townsend said that the larger number of gonorrheas he had observed, had readily extended to the prostate. He, therefore, could not speak favorably of retrograde injections of the anterior urethra. He believed from many clinical observations, that the selection of the medicament formed a potent factor in the rapid cure of the disease. He observed rapid and satisfactory results from intravesical irrigations of silver salts, especially albargin 1 to 2,000 following massage, in subacute follicular prostatitis, and concludes that this agent is of most service when gonococci becomes scanty and individual. Argyrol had not given him the results which its preliminary reports promised, though it proved the least irritating of the remedies that are offered as gonococcides.

## SOCIETY OF ALUMNI OF BELLEVUE HOSPITAL.

*Meeting of May 6, 1903.*

The President, Robert T. Morris, M.D., in the Chair.

**Left Nephrectomy and Right Nephrolithotomy on the Same Patient.**—Dr. John F. Erdmann reported this case, and exhibited the patient showing the long vertical incision for the former, and the long oblique incision for the latter operation. The patient was thirty-one years of age, had been married fourteen years and had suffered several attacks of colicky pain, the last one being severe and characterized by a pain radiating to the side and extending down to the genitals. The patient had previously passed several small calculi. On incision of the transversalis fascia eight ounces of turbid, semi-purulent fluid escaped. The cavity was washed out with normal saline solution. Each operation took about forty minutes. Twenty-one small stones, weighing five grains, and one large one, weighing three drams, were removed from the pelvis of the kidney. An X-ray photograph taken by Mr. Caldwell showed the position of the calculus. Convalescence was assured after the first day. The chemical analysis, made by Prof. Mandl, showed an excess of uric acid and small quantities of calcium and magnesium phosphate.

**Notes on Torticollis.**—Dr. L. W. Hubbard presented this paper. He said that in considering the question of torticollis from the surgical standpoint it must be looked upon, not as a matter of life and death, but as a condition demanding relief because of the deformity. Torticollis might be defined as a contraction of certain muscles, usually the sternomastoid, but sometimes other muscles, along with the fascia and subcutaneous tissues. There was much difference of opinion expressed in the literature as to the frequency of torticollis. The two chief varieties were the congenital and the acquired. Out of 500 cases, seen at the Hospital for Ruptured and Crippled, 87 were congenital, a fact which seemed to bear out the author's opinion that there was a much larger proportion of congenital cases than was generally supposed. For some time Stromeyer's theory as to the cause of this form had been accepted, *i.e.*, that a rupture of the affected muscle occurred during delivery, most of these cases being breech presentations, but at the present time the prevailing opinion was that the cause of torticollis was to be sought in some prenatal condition, such as inflammation of the muscle and fascia. The acquired form was conveniently subdivided into the acute, the chronic and the spasmodic variety. In some instances torticollis developed years after birth, making this condition analogous to clubfoot. The characteristic deformity was a turning of the chin *away* from the contracted muscle, a point of diagnostic importance, for, by its aid, one was enabled to differentiate torticollis from cervical Pott's disease. In the latter the chin turned toward the contracted muscle, and there were pain and muscular spasm. Certain forms of torticollis, due to rheumatism, enlargement of the cervical glands and other causes, yielded readily to treatment on the removal of the cause.

The treatment was worthy of careful consideration, though there seemed to be a reluctance to recognize the importance of early treatment. A case was cited in which a young girl with a simple curvature was treated unavailingly by means of exercises, with the result that there was marked deformity. These cases should be subjected to treatment as soon as diagnosticated. Up to the sixteenth century no treatment had been employed except splints. In 1639 the first operation for torticollis was performed; later on Dupuytren practised subcutaneous tenotomy, a method even now employed by some surgeons. In doing this operation the vessels and subcutaneous tissues were liable to be injured, and on this account Dr. Hubbard thought the open method was more scientific. He advocated making a linear incision of sufficient size to thoroughly expose the fascia and muscle, and then dividing every contracted tissue. Primary union generally followed, and only a slight scar was left. The head should be kept in proper position until union had taken place. It was better to do the operation under general anesthesia, but he had operated under cocain anesthesia. The first case operated upon was that of a woman of twenty-nine years in whom the deformity had existed since birth. In this case a portion of the trapezius muscle was affected. In another case, occurring in a girl of fifteen years, a perfect result was obtained. The postoperative treatment should consist of appropriate exercises continued for about one year.

Dr. William J. Chandler said that, judging from an experience of thirty years, he would say that torticollis

was a rare complaint. He recalled one obstinate case which had developed after measles, and had persisted for a year or two.

Dr. H. S. Houghton said he firmly believed in the existence of the congenital form of torticollis, and recalled the case of a child born with it in which the head was rotated to the left side. After having the child under observation for some time the case had been referred to an orthopedic surgeon, and was now wearing a brace coming up under the chin, in this manner correcting the deformity.

Dr. H. H. Seabrook spoke of eye torticollis, or "head tipping," a condition dependent upon paresis of the eye muscles, generally the superior rectus. He said that Stevens had attributed this condition to the image being focussed on the perpendicular plane. Of course, these cases were not true torticollis, and most of them were transient, the head being tipped only when the patient stopped to look at something. He had seen 365 such cases in the past three years, and thought orthopedic surgeons would do well to bear this in mind.

Dr. Hubbard, in closing the discussion said that when an early diagnosis was made operation was not necessary, other means proving sufficient for correction. The cases referred to by Dr. Seabrook were not examples of true torticollis, for at times the patient was able to hold the head straight, and they were usually relieved by appropriate treatment of the eyes. In true torticollis a downward position of the eyes persisted even after the deformity had been corrected.

**Do Our Present Modes of Living Tend to the Increase of Certain Forms of Nervous and Mental Disorders?**—Dr. C. E. Atwood, of White Plains, N. Y., read a paper with this title. That some forms of insanity were on the increase, the author said, he had first proved to his own satisfaction while preparing a paper on "The Teaching of Recent Investigation Into the Causation of Insanity," read before the Social Science Association in 1891. There was also no doubt that neurasthenia and some allied neuroses were also increasing, and the fact of this increase in nervous and mental disorders he attributed to our present methods of living. By this was meant our rapid and overstrenuous life, its varied and increasing demands upon us and the associated irregularities in eating, drinking and sleeping with a tendency to overindulgence. At first glance many might be disposed to take a pessimistic view of the effects of the present strenuous life, but a closer study of the facts would show that harm was only likely to result when the balance was not maintained by sufficient variety, rest and sleep. Whenever wear and tear were excessive and rest and repair deficient the result was bound to be disastrous, if not in the present, certainly in the next generation. All cellular activity required cellular rest. A nerve cell which had been subjected to five hours of artificial stimulation had been found to require twenty-four hours' rest in order to fully recover from the exhaustion and the changes induced by such activity. What took place in the cell when artificially stimulated probably occurred, to a less degree, in the mental and physical activities of daily life. The normal symptom of cell exhaustion, fatigue, was dissipated by rest and sleep, during which the blood current carried off most of the products and restored cellular activity. This brought up the question of auto-infection. The usual form of auto-infection was that produced by morbid alimentary action. There was, however, a more dangerous form, caused by incomplete oxidation of the products of the worn-out body cells. These products of suboxidation were called alexins. Anything which interfered with complete oxidation probably caused neurasthenia. The autotoxins would produce toxic effects upon the nerve centers. Some neurologists went so far as to say that all forms of insanity were caused by auto-intoxication, but most of them admitted that some varieties had their origin in tabes dorsalis, syphilis, epilepsy, convulsions in early life, etc. Most forms of insanity were due to neurotic and faulty tendencies and inheritance, either in the parents or grandparents, a fact frequently exemplified in cases of chorea and alcoholism. When one recalled the potential traits of the individual, and how each began in the germ plasm, there was little wonder concerning the profound influence of heredity. If normal products showed this influence, it was but natural that abnormal ones should bear evidence of it to a still greater degree. The speaker then referred to the increased per capita use of alcohol in the United States. He said that we were the most nervous people in the world, and that this was probably the result of our mode of life. Overwork did not cause neurasthenia unless it was accompanied by loss of sleep, drug addiction, excessive eating and drinking, etc., thus leading to arteriosclerosis and apoplexy. In 1892 the average age for the occurrence of apoplexy was 58.9 years; in 1902 it was 64.2 years. The brachiocephalic type was found in the cities, the dolococephalic type prevailing there. Mental derangements were increasing among negroes. In 1890 50 per cent. of the insane were of foreign-born parents and 30 per cent. were themselves foreign-born, the Russian Jews vastly predominating.

The number of cases of hysteria and neurasthenia had doubled. Alcoholic neuritis was three times more prevalent, and there was a slight increase in tabes and general paresis. The increasing dangers of our modern life could be offset by teaching hygiene and by change of occupation and securing needed rest. In the opinion of the speaker the "yellow journals" were responsible for a certain amount of crime and suicide. He suggested that the restriction of immigration in certain cases would result in a decrease of insanity.

Dr. Charles E. Quimby agreed with the author as to the probability that apoplexy was caused by a toxemia. The arterial change was not due to high tension but to cardiac, renal and arterial changes throughout the body, though more particularly in the brain.

Dr. Russell Bellamy thought the increased number of neurasthenics was attributable to sexual excesses and lack of segregation in the control of gonorrhea and syphilis; also to the sexes being thrown so closely together, for never before in history had men and women been brought into such close association. In olden times men worked in the field and the women stayed at home; now they worked side by side.

Dr. J. W. S. Gouley said that if he had understood Dr. Atwood correctly the statistics quoted regarding the use of alcohol applied to alcoholic beverages. He felt sure that a comparison of the statistics regarding the per capita use of such beverages in England, France, Germany and the United States would show that we were a very sober nation.

Dr. Seabrook said that the conclusions drawn from the State hospitals would be overthrown if compared with the statistics from private practice, for the foreign element predominated in public institutions. He pointed out that the Chinese and Japanese were a very nervous and dissipated people.

Dr. Atwood, in closing the discussion, said that he had not intended to be pessimistic on the question of alcohol. He then read a portion of an article reproduced from a papyrus six thousand years old, taken from a tomb of the fifth dynasty, in which the author deplored the deterioration of his age, and mourned the good times that had passed away.

# THE MEDICAL NEWS.

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## ORIGINAL ARTICLES.

### PRESIDENTIAL ADDRESS ON THE CARE OF EPILEPTICS.

BY FREDERICK PETERSON, M.D.,

OF NEW YORK;

PRESIDENT OF THE NATIONAL ASSOCIATION FOR THE STUDY OF EPILEPSY AND THE CARE AND TREATMENT OF EPILEPTICS.

LET me first express my thanks to you for the great honor you have conferred upon me by electing me President of this useful organization. One of the duties of the office is that of opening the annual convention with a brief address.

Interest in the epileptic has grown of late years with a sort of geometrical progression. It now seems scarcely possible that fifteen years ago one could have written that epileptics were the most neglected of all the world's unfortunates; that physicians took no interest in a disease so familiar that little improvement has been made on the clinical description given by Hippocrates 2,400 years ago, so widespread that one person in 500 is afflicted with it, making a total of perhaps 140,000 cases in the United States alone. No general hospital received the epileptic. No school would accept him as a pupil. Playmates shunned him. The church was closed to him. No employer would keep him in his employment after his once having had an attack while at his work. Every avenue for mental or moral development, through occupation, schooling, recreation, and association with his fellows was closed to him. He was a burden to his family. The physician pronounced him incurable, and gave him bromides ad libitum, which while often reducing the number of attacks as often wrought physical and mental deterioration. What wonder then that he grew up dull and ignorant, intellectually feeble, morally depraved, irritable in temper, with tendencies to imbecility and insanity rather than to mental advancement.

There were at that time two refuges open to him, the insane asylum and the almshouse, and a considerable percentage of the population of such institutions was made up of sufferers from epilepsy.

But after twenty-four centuries of familiarity with the disease there was in 1887 a sudden general awakening to the actual state of the epileptic as described above. Simultaneously in England and the United States, movements were set on foot to better his condition. Some years before this a Lutheran pastor in Germany had in a quiet way, and quite unknown to the rest of the world studied the condition of this class, and worked out a successful solution of the whole problem of their care in the noble colony scheme which he inaugurated at Bielefeld. It was the published descriptions of this colony in various English and American periodicals that first aroused public attention in these countries.

It is true that one or two private institutions in Europe had provided homes for epileptics previous to the undertaking at Bielefeld, and it is also true that the State Board of Charities of Ohio had considered long previously to 1887 the need of some special provision for epileptics; but whatever had been done or considered was as nothing compared with the scheme ideally conceived, and successfully executed by Pastor von Bodelschwingh at the little German town in Westphalia. Here grew up from small beginnings a village inhabited solely by epileptics, and their caretakers, instructors and physicians. Here everything was provided to meet their peculiar needs, to make up for their deprivations in the outside world. They were supplied with schools to improve their minds, industrial teachers to make them more or less self-supporting, and physicians to study their cases and improve or cure them. Outdoor occupations were especially favored as helping to ward off attacks. Special diet so useful in epilepsy, was provided. Recreations, amusements and religious instruction were features in the plan. For such as were incapable of improvement or cure, the colony was to be a home, and a home in the real sense of the word; not a great barrack-like structure in which patients might go by numbers, and in droves with lost individualities, but a village of small houses, each of which under the care of housefather or housemother became a little family home by itself. And the spirit which governed this great aggregation of unfortunates, and which penetrated into every home and informed the whole was a unique and wonderful benevolence.

When the success of this scheme became known to the world, its effect in various countries was magical. Immediately steps began to be taken everywhere to provide for epileptics. Other colonies were founded in Germany, in Switzerland, in Holland, in France, and in England. Ohio established the first institution for epileptics in the United States, though, unfortunately, on the hospital rather than the colony scheme. New York has the Craig Colony, at Sonyea, closely modeled on the Bielefeld plan, and with a population today of 825 epileptics, the exact number of colonists at Bielefeld when I first visited it in 1887. Under Dr. Bullard, Massachusetts erected a colony at Palmer. Dr. Sinkler was the prime mover in the establishment of a colony farm at Oakbourne for epileptics in Pennsylvania. There is a New Jersey State Village for Epileptics at Skillman, described by Dr. Weeks in the published report of the Association. A colony for epileptics is in course of construction at Abilene for the State of Texas, an account of which has been

written by Dr. Worsham for the Annual Report of this Association. Dr. Drewry is rapidly pushing the matter of special provision for epileptics in Virginia. There are strong movements on foot for similar projects in Illinois, Connecticut, Indiana, Kansas, North Carolina, Missouri and Minnesota. Dr. Osborne has been indefatigable for years in his efforts to achieve the same purpose in California.

In other countries there has been equal activity. England was the first to found a National Society for the Employment of Epileptics, and a fine colony has been established by this body at Chalfont St. Peter. In addition to this there is one near Liverpool (the Maghull Home), one at Godalming (Meath Home), a large colony at Chelford, just being constructed through the munificent bequest of David Lewis, and finally a fifth institution in England is about completed, for the City of London, not far from Croydon.

A reference to the recently published Annual Report of our own National Association for the Study of Epilepsy and the Care and Treatment of Epileptics (founded in 1898) shows how widespread is the movement for the special care of epileptics all over the world, for here are articles by agitators of the subject in Brazil, Belgium, Switzerland, Sweden, Russia, Italy, Turkey, India, Japan and Australia. At this present session just opening to-day, we shall doubtless hear still further good news of the growing interest in the objects of our solicitude in all quarters of the earth.

The particular purposes of this Association as set forth at the time of its foundation were as follows:

1. To promote the general welfare of sufferers from epilepsy.

2. To stimulate the study of the causes and the methods of cure of this disease.

3. To advocate the care of epileptics in institutions where they may (*a*) receive a common school education; (*b*) acquire trades; (*c*) be treated by the best medical skill for their malady.

4. To assist the various States in America in making proper provision for epileptics.

To these ends we have invited citizens of all parts of the United States to become members and to take part in our deliberations, not only physicians and scientists who may aid us in the study of the causes and methods of cure of epilepsy, but also State officials, jurists, clergymen, teachers, philanthropists, and in fact all persons who for any reason might feel an interest in the objects of this organization. There is no initiation fee, and there are no dues. The association has relied upon voluntary subscriptions for means to defray its expenses. The cost of publication of last year's proceedings, amounting to over $600, was defrayed by Mr. Letchworth, our first president, and the means for issuing the records of to-day's session are already forthcoming.

While we have every reason for congratulation on the amazing accomplishments of fifteen years, there are still directions in which this body can be of service. There are many States of the Union still unaware of the conditions of these unfortunates gathered together in their almshouses and asylums. If in such commonwealths the Presidents of the State Medical Societies would appoint committees of medical men to inquire into the numbers and needs of their epileptics, an excellent beginning would be made, and by arousing general public interest great ultimate good would result. Incidentally, by such schemes already undertaken in certain States, and through the dissemination of literature by this and kindred societies and their members, a new interest in the disease itself has grown up among medical men the world over. More attention is being given to the patients suffering from epilepsy. New remedies are being brought forward. In the laboratories the pathology is being reinvestigated according to new methods. This disorder which has been the *opprobrium medicum* for 24 centuries will surely some day give up to us the secrets of its prevention, causes and cure.

Now, in closing, let me say one word more by way of appeal to those who cannot contribute to the advance of our work in any other way—money could not be better expended than by donations for the following purposes, viz.:

To spread throughout the Union literature relating to the colonization of epileptics.

To establish in the colonies now existing, trades schools, churches, libraries, and other features for promotion of the general welfare of the patients already gathered together.

Last, but not least, to found and endow laboratories in connection with every institution for epileptics wherein the disease may be investigated by trained scientists for the purpose of discovering its causes and its remedies.

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## NATURE, FREQUENCY AND POSSIBLE SIGNIFICANCE OF THE VARIOUS FORMS OF EPILEPTIC AURA.*

BY WILLIAM P. SPRATLING, M.D.,

OF SONYEA, N. Y.;

MEDICAL SUPERINTENDENT OF THE CRAIG COLONY FOR EPILEPTICS; MEMBER NEW YORK ACADEMY OF MEDICINE; AMERICAN MEDICO-PSYCHOLOGICAL ASSOCIATION; BUFFALO ACADEMY OF MEDICINE; ROCHESTER PATHOLOGICAL SOCIETY.

In its literal meaning the word aura signifies "vapor or emanation from the body, surrounding it like an atmosphere;" though in the sense in which it is employed to indicate a warning of an approaching attack, it has come through usage to have a much broader application. It appears originally to have been used by the ancient Greeks, who thought the fit began in the form of a "spirituous vapor" in the veins of the extremities that ascended to the head, when the patient became unconscious.

For a long time it was held that the nervous impulse or irritation causing the spasm began in the part where the aura first occurred, though now it is generally held that in the vast majority

* Read before the New York Academy of Medicine, Section on General Medicine, April 21, 1903.

of cases the impulse begins in the central nervous system, the sensation only being referred to the periphery. At the same time, there may be an occasional case in which the impulse starts at the periphery, as has been shown by the cessation of the attacks when the local irritation was removed; an irritation like an adherent prepuce, or a stricture of the urethra; or again when the tying of a cord tightly about the member affected would check the progress of the fit. But in all such cases the question arises as to whether we ought to designate them as epileptic, or simply as reflex, or epileptiform.

It is well known how disease of the brain may cause descending degeneration of the spinal cord, or ascending disease in the spinal cord produce disease of the brain. Experiments have proved that a nervous injury in the periphery may not only cause changes in the central nervous system, but structural alterations in nervous tissue and functions in other parts of the periphery.

Brown-Sequard showed this to be true when he cut the sciatic nerve in the leg of a guinea pig and caused structural alteration in the skin of the face, afterward producing epileptiform convulsions by irritating certain portions of the face, then removing the basis of the attacks by excising this epileptogenous area.

We may also mention in this connection the referred sensations in coxalgia, the pain being most sharply felt in the knee and ankle joint, and the acute gastric pains that often follow vertebral disease.

On the other hand, there has been a growing tendency for some years past to regard the aura as essentially constituting a part of the epileptic attack, and this seems to us to be entirely reasonable; fully as much so as it is to regard fever and congestion as preliminary parts of pneumonia, when pneumonia follows. Sometimes the aura arises and persists for an indefinite period and disappears without an attack following; just as there may be fever and congestion of the lungs without pneumonia following. It is, therefore, in our opinion, a good plan to look upon the aura as the commencement of the fit, not simply as a warning of its approach, and to treat the case accordingly.

Unfortunately this cannot often be done, for it is rare for the physician to see the patient before the convulsion has occurred, the aura being not far removed from the attack itself, generally not more than a few seconds, occasionally half an hour or so, while in very exceptional instances the period is longer.

We can best study the various auras by grouping them under four heads as follows: (1) psychic, (2) sensory, (3) motor, and (4) irregular. The first including some disturbance in the patient's mentality; the second some disturbance in sensation; the third some disturbance in his motor system; while the fourth embraces elements of two or more, or even of all of these.

It is difficult to say which of these forms of aura possesses the greater clinical importance, though because they so greatly outnumber all the rest we incline to attach the greatest weight to those of a sensory nature; those in which a feeling of some kind, a numbness, or tingling, or pain, or feeling of discomfort, is felt for variable and indefinite periods before the fit comes on.

In a close analysis of 815 males and 510 females for the establishment of individual auras, it was found that 319 males, equal to 36⅓ per cent. of the entire number, and 186 females, equal to 36½ per cent. of the entire number, had a sensory aura of some kind. It is worth noting how remarkably even this form of aura ran parallel in the two sexes.

In the same cases, 33 males and 19 females had psychic auras, the 52 cases in both sexes constituting less than four per cent. of the entire number, while 22 males and 10 females, 32 in all, a fraction over two per cent. of the total, had a motor aura of some kind. Combining all who had an aura of some kind, we have a total of 589 out of 1,325, equal to about 45 per cent., leaving 55 per cent. who had no aura.

It appears from this that less than one-half of all cases have a specialized aura, though it is best not to regard this as conclusive, for it is reasonable to suppose that some epileptics of low intelligence experience sensory auras they are unable to describe. Allowing for these, it seems safe to say that 50 epileptics out of every 100 have an aura of some kind.

This proportion is much greater than that mentioned by Echevveria, who states that a perceived aura was found in 10 per cent. of the males and 11½ per cent. of the females in the 306 cases studied by him.

Gowers classifies the auras under seven groups, in substance as follows: "(*a*) unilateral; (*b*) certain general auras such as sensations in the limbs, tremors, faintness, etc.; (*c*) auras referred to certain organs, especially those supplied by the pneumogastric nerve, most of the visceral warning coming under this head; (*d*) vertigo and allied sensations; (*e*) certain sensations in the head, pain, etc.; (*f*) psychical auras, the consciousness of an emotion or idea; (*g*) special sense warnings, some of these being unilateral;" and in 1,000 cases found

(*a*) A unilateral aura in 86, topographically distributed as follows: in the arm in 45 cases, legs 15, face 17, tongue 7, trunk 2. (*b*) Bilateral general aura in 74, in the arms 11, legs 12; shivering, trembling, nausea and weakness in 51. (*c*) Auras affecting organs, 106. (*d*) Fainting and dizzy aura, 90. (*e*) Head aura, 50. (*f*) Psychic aura, 25. (*g*) Aura of the special senses, 119.

A total of 600 epileptics out of 1,000 cases observed by Gowers had an aura of some kind.

According to Binswanger, Herpin found an aura of the sense organs in 27 per cent. of all cases; while Bennett found an aura of some kind in 34.4 per cent., the latter finding the aura relatively rare in major epilepsy and far more frequent in the milder forms, a fact verified by our own experience.

Voison* and Féré† classify the auras under four heads: motor, sensory, sensorial, and intellectual, following that used by Dela-Siauve, but neither give an estimate of the proportion of each, Fere stating that "it (the aura) is very frequent: O'Connor has found it in 78 cases out of 100."

According to Féré, "Thorion claims that the epileptic crisis is preceded by a greatly increased elimination of the urinary elements, a veritable discharge; this chemical aura he thinks might even enable one to predict the return of the attack."

It is impossible to estimate with accuracy the number who have irregular forms of auras, but they are not common, occurring less frequently than those of a psychic nature.

This form was illustrated in a woman who first experienced a feeling of buoyancy and exhilaration, that later on gave way to a highly emotional state that persisted for several days, and sometimes even for weeks, before an attack; while for two or three days before the attacks a motor aura in the way of uncertainty of gait, the patient stumbling along as though half tipsy, or the inability to grasp or pick up a small object like a button or a large needle, appeared and grew more pronounced until the fit was over, when this bilateral paretic condition and unbalanced emotional state both completely disappeared.

Psychical aura may appear in the form of a sudden abnormal mental state, leaving a definite impression on the memory, due to the fact that brain processes which attend mental states may leave a residual effect which makes it possible for their subsequent revival, the perception of which we are apt to refer to as "psychical sensations."

The most common form assumed by the psychical aura is the sudden acceleration of the imagination, a quick overflowing of the processes of thought, in which the train of the imagination, ever rapid, is rushed ahead with trembling, excited haste, until the thread is snapped and unconsciousness occurs.

In some cases this stimulated speed of the imagination may be preceded by confused ideation, with different memory pictures appearing momentarily in succession.

Romberg mentions a young man with epilepsy who for nine years had the same recurring thought which was never quite clear to him and which caused him great unrest. He endeavored to free himself from the idea which took the same course every time, to disappear with the beginning of the attack.

Binswanger states that "similar observations in which in each attack definite memory pictures appeared in 'glaring psychic illuminations' are found still in the literature."

When such sensations precede an epileptic fit, they may also be in the simpler form of an emotion or an idea, the former generally being in the form of fear, an apprehension of something evil about to occur, the patient being genuinely frightened and attempting to run away. We have seen a number of cases in which the patient's face wore a terrified aspect, in one or two instances trying to run away from danger the patient felt in some way impending. The presence of the feeling of fear is also testified to by patients who involuntarily show fight when interfered with while in a seizure or just as they are going into one.

A young man was subject to frequent attacks of psychic epilepsy, during which he would appear pale, confused and ill for some time before the fit, and not infrequently got into trouble in public places by assaulting the person who felt it his duty to care for him when he seemed to require it. If let alone, he would pass through the seizure all right, but the moment a hand was laid on him to assist him, he became extremely violent and would fight with great vigor until he was overpowered. He was always ignorant of his acts in this respect after his fit was over.

Fear of a primary, instinctive, and therefore of an unreasoning kind, is the type met with in psychical aura, and it springs from the instinct of individual conservation.

According to Th. Ribot, in "The Psychology of the Emotions," fear is the first, in chronological order, of the instincts to appear, showing itself, according to Preyer, at twenty-three days, according to Perez, at two months, and according to Drawin, at four months.

Ribot then goes on to speak of the characteristic marks of fear, so far as it affects the innervation of the voluntary muscles; of the muscles of organic life, and finally of the vaso-motor apparatus, the concrete results making a very distinct picture of the condition of fear.

The very interesting question now arises as to how fear can be artificially induced; in other words, what is the process that brings it into existence so that it stands for a symptom in part of an epileptic convulsion? If we could answer this, we could place at least a part of our psychological studies on firmer ground.

The warnings which take the form of "ideas" are generally dependent on special sense conceptions, especially on vision. Gowers mentions a woman who saw London in ruins, the Thames emptied to receive them, and herself the lonely survivor. This he calls a manifest "psycho-sensory warning."

All special disturbances such as these have the same basic meaning; they indicate some instability of the centers connected with the psychical processes.

We have just referred to a woman who had an irregular aura, the first part of which was psychic and which gave her a feeling of great buoyancy and exhilaration. While this is not a common aura, it is distinct in type and of more than passing interest.

Binswanger in describing the disturbances of

* L'Epilepsie, 1897, p. 54.
† Epilepsy, Twentieth Century Practice of Medicine, Vol. X, p. 593.

feeling due to an approaching attack, states that "more rarely we find sensations of serenity, placidity, calmness, sudden apparitions of joy, rapture, colossal lightness, an elevating good feeling. Some patients declare that in the beginning of the attack they feel freed from a heavy burden." This exactly portrays the emotional state the Russian novelist Dostoieffsky, who suffered from epilepsy, applies to himself in "Besi."* "There are moments," he writes, "and it is only a matter of five or six seconds, when you suddenly feel the pressure of eternal harmony. This phenomena is neither terrestrial nor celestial, but is an indescribable something which man in his mortal body can scarcely endure. . . . The terrible thing is the frightful clearness with which it manifests itself and the rapture with which it fills you. During those few seconds, I live a whole human existence."

Sensory auras are vastly more common than all the rest and partake of the greatest imaginable range in character. They may be confined to the special senses and include perversions of taste, of smell, of sight and of sound. Any abnormality in the functions of the special sense organs may be fleeting and transitory, or may in some instances persist for hours before the fit comes on.

Visual auras greatly predominate, occurring as often as those of taste, hearing and smell combined. They usually take the form of flashes of light; the colors of the rainbow passing in rapid succession across the field of vision. In other instances they appear in the nature of optical illusions; people, dogs, cats, wild animals of various kinds being engrafted on the visual field; while it still more rarely happens that temporary blindness immediately precedes the attack—Amaurosis epileptica. In some instances the sudden loss of sight may alone constitute the entire attack, the area of the discharging lesion being so circumscribed as to produce no other results; many cases of persons being suddenly stricken blind doubtless being due to this simple cause.

The following instances taken from the author's cases are typical of the more common forms of visual aura: "Flashes of light, then blackness;" "an object passes before the eyes five to ten minutes before the attack:" "dark objects move before the eyes;" "blurred vision;" "flashes of blue and red;" "flashes of light of the rainbow colors;" "at times sees colors;" "sees wavelike motions in the air just before the fit;" "at times have loss of vision:" "visual percepts of light:" "vapor before eyes and numbness in paralyzed hand:" "eyes get dim:" "visual aura at times—sees a policeman:" "partial blindness:" "sees black, then a yellow light;" "occasionally a visual aura—sees stars, at other times the aura is epigastric;" "sees some animal approaching:" "everything looks bigger than it ought to be just before the fit; people, chairs and tables are magnified."

According to Sir William R. Gowers, it is not surprising that when central instability exists, the visual center should often lead the way in the sudden derangement of balance, for light constitutes the most rapid form of motion of which we have any perception, consequently it must be associated with a corresponding degree of delicacy in the central stimulus that receives new impulses produced by waves of light.

In addition to the forms of visual aura in which colors predominate, other sensations occasionally affect the eye just before a fit; one of these being diplopia, or double vision, a case of this kind being mentioned by Gowers, in which the diplopia was associated with an aching in one eye and an apparent magnification of objects to twice their usual size.

This curious condition is seldom encountered, the probable explanation of it being found in the increase or diminution in the sensitiveness of the visual center, which produces an effect on consciousness analogous to that produced by the stimulation of a larger or smaller area of the retina by a larger or smaller image.

A male epileptic, twenty-four years of age, that came under my care, had this aura, objects about him increasing greatly in size 10 to 12 seconds before the fit appeared.

In a few cases there is a sensation of pain in the eyeball, due probably to some irritation of the fifth nerve, these cases generally having a motor element in them, such as twitching of the muscles about the eye.

Gowers reports a case* that came to autopsy in which the fits were preceded by a flash of light or pain in the eye, the autopsy revealing the presence of a tumor in the occipital lobe, which extended as far forward as the angular convolution.

In addition to all these, there have been reported cases of highly specialized visual sensations in the form of complex visual conception, or psychovisual auras; that is, a psychical aura, crowding itself in upon the patient's field of consciousness coincident with the appearance of some distorted visual percepts. For instance, a woman first always saw bright lights—red, green, yellow—and then the lights continuing, she saw a girl "and tried to get to her to ask what the lights meant," and then fell in a fit.

When one color only is seen, it is most apt to be red or blue; the most prominent order of appearance of the colors being red, blue, green, yellow, and occasionally purple. This order is not in harmony with the physical relation of colors, nor does it correspond to the areas of retinal perception, for red, which is oftenest seen, has one of the smallest retinal fields. On the other hand, it does correspond to a certain extent with the degree of visibility of colors, for Gowers credits Cohn with having observed that the order in which spots of color one millimeter in size can be seen in direct sunlight at a certain distance, is as follows: red, blue, green, yellow, violet, which appears to be very nearly the order they appear as auras in epilepsy.

Occasionally we find auditory and visual auras associated, though this combination is rare, while

* The Man of Genius, by Lombroso, 1891, p. 339.

* Epilepsy and Other Convulsive Diseases, p. 79.

we have knowledge of one case in which there was complete unilateral loss of hearing just before the fit.

Auditory auras partake, as a rule, of the nature of the following: "Roaring and voices heard two or three minutes before the convulsion appears;" "roaring in the ears;" "sound of sea waves in the ear before mild attacks;" "roaring and buzzing in the ears;" "noises in the head for a brief period before the attack;" "roaring followed by a sensation of falling."

Auditory auras occur about one-fourth as frequently as those of a visual nature, which are generally present in two per cent. to three per cent. of all cases.

In addition to the forms of auditory disturbance enumerated above, the patient may hear sudden sounds of almost any nature, like the crash of a heavy falling body, the blowing of a whistle, the ringing of a bell; while more rarely there may be the sounds of voices or of music alone.

L. Pierce Clark* quotes Sante de Sanctis and A. Christiani as reporting three cases in which the patients indulged in a variety of songs while undergoing mild convulsive movements: two of them keeping time to imaginary music with rhythmic movements of the body, these two showing some clonic muscular movements in the lower extremities, while the third sang a single tune, accompanying it with movements imitating an orchestral direction.

The writer is familiar with the cases of two young adult male epileptics, one of them victim of an infantile palsy affecting the right hand and foot, both of them subject to grand as well as petit mal attacks, the latter form being not infrequently announced in each by a period of involuntary whistling. I had occasion to witness this phenomenon in one of them five times in one day, the first indication of an attack being a sudden cessation of all movement on the part of the patient; he would stop and stand still if walking, followed by a confused, puzzled expression, when he would grunt quite audibly two or three times, and then whistle a bar from a popular song of the day, repeating it with the next convulsion in the most precise manner. He was fully cognizant afterward of what he had done, as shown by the fact that he always turned to me with the question, "Did you notice that one?"

On one of these occasions, he caused a bank cashier with whom he was dealing at the moment, much astonishment and concern by suddenly repeating the usual grunt two or three times, then whistling a bar from a popular opera while arranging an important financial transaction. None of the anomalous states lasted more than five to seven seconds. At times they appeared as epileptic equivalents, at others as forerunners of more pronounced convulsions.

We recall two cases in which mild seizures were accompanied with complete auditory deafness, the patient's sight remaining normal, so that motions made to the patient to do certain things were immediately obeyed, while spoken commands were unnoticed.

Extraordinary sensations in connection with olfaction and the gustatory sense are occasionally met with, while they take the greatest possible range in character and are generally of an unpleasant nature.

Gowers thinks it significant that flavors which are perceived only through the olfactory nerve seem to be associated with taste in the central discharge which causes the warning, the flavor in this instance being of a kind that enters the posterior nares, causing a simultaneous stimulation of the true gustatory nerve.

Some epileptics experience a bitter taste, like quinine, while others have a metallic taste in the mouth that sometimes persists for an hour or more before the convulsion. One patient complained of a feeling of "numbness in the tongue," as though that organ had been completely cocainized, while Watson mentions an epileptic who could abort an approaching attack through voluntarily biting his tongue quite severely, doubtless having first experienced an unusual sensation of some kind in it.

Hughlings-Jackson* speaks of having drawn attention to a group of cases in which there is at the onset of the paroxysms a crude sensation of smell or of taste, in which there are movements of chewing, smacking of the lips, and sometimes spitting, all being ascribed to disturbances in the cortex. Some of these are foreshadowed by an epigastric warning.

A. T. states that he almost always has light attacks following severe ones at night, and following the light attacks he has a peculiar taste and sensation in the mouth which he describes as follows: The first is a "sour taste;" the second similar to that of "wheat bran in the mouth;" the third a feeling of "stringiness," combined with "numbness in the upper part of the mouth;" the fourth a "sickish, sweet taste" great enough to produce extreme nausea; the fifth a "filthy, nasty taste" which is extremely disagreeable; the sixth and last being a feeling of "sliminess" in the mouth.

These disorders of taste may persist for a day and gradually shade out from the sixth condition to that of normal sensation.

The morning following the patient feels "unusually well;" much more so than during any time more distant from his seizures. These disorders of taste persisted for years, and patient states that they cannot be ascribed to stomachic indigestion.

According to Ferrier, the senses of taste and smell are located in the uncinate gyrus, since reflex irritations of this gyrus in the animals he experimented on produced "reflex" movements analagous to those just mentioned as occurring in the human subject prior to, or as a concomitant of lesser epileptic convulsions.

*The epigastric aura* is more commonly met with than all the other sensory auras combined, its presence having been noted in some form in 200

* Medical News, Sept. 1, 1900.

* The Lancet, Jan. 14, 1899.

cases, equal to 15 per cent. of the 1,325 studied by me.

The nature of this aura is not very variable, for it quite constantly appears in one of three forms: the first and most common being that of "a gnawing, indescribable, indefinable sensation at the pit of the stomach" that lasts anywhere from a few seconds up to, but rarely beyond, half an hour before the fit is established; the second being "a deep-seated burning pain;" the third "a feeling of nausea that grows in intensity and rises like a choking sensation toward the head until the sensation reaches the throat, when consciousness is lost;" the latter closely resembling the globus hystericus.

The location and cause of the pain in these cases is entirely problematical. They may be due to some disturbance about the centric origin of the vagus nerve, which has a wider distribution than any other of the cranial nerves, supplying the organs of voice and respiration with both motor and sensory fibers, the pharynx, esophagus, stomach and heart with motor fibers. Its immediate communications are extensive and remote, while the seat of its origin is in control over the two vital processes of respiration and circulation.

The rhythmic sequence of the respiratory movements are apparently due to periodic discharges from the respiratory center located in the floor of the fourth ventricle on each side of the median line, the two halves being intimately connected by commissural fibers. The cause of this periodicity is obscure, but since it has been shown* that after the combined section of the vagi and glossopharyngeal nerves, the spinal cord in the lower cervical region, the posterior roots of the cervical spinal nerves, and the separation of the spinal bulb from the parts above, the rhythm continues, indicates that such periodicity is inherent in the nerve cells and is not caused by external stimuli carried to the center through afferent fibers.

Loewy has shown that under the above circumstances, the rhythm is due to the blood "which, while acting as a continuous excitant, causes discontinuous or periodic discharges," and since the blood supply is under nervous control, the respiratory center is automatic only with reference to external nerve stimulation.

The problem in epilepsy that rests on this point is to determine whether the initial disturbance, *the thing that breaks up the rhythmic periodicity of the respiratory impulse*, is to be sought in the respiratory center primarily, or whether it lies somewhere in the periphery, in the stomach or heart, or especially in the circulation, and is carried by some vital process to the seat of the respiratory life.

It is unusual for the epigastric aura to be referred to any other locality than the immediate region of the stomach. In one case the pain first appeared in the right ileac region, and was always attended with a feeling of nausea, and it is noteworthy that while the vague sensation that nearly always accompanies it passes upward to the throat and head, the pain remains stationary in the region of the stomach. As a rule, as soon as the aura reaches the head, consciousness is immediately lost.

Many cases that exhibit the epigastric aura suffer from indigestion, that makes its appearance to some extent periodically; other stomach disorders being distention, gastric catarrh and flatulence.

It seems now a problem as to whether these conditions precede or follow the initial manifestations of the fit, and on this point we differ with Sir William R. Gowers, who goes so far as to say, "We are not justified in assuming that flatulence is the cause of the attack any more than we are in regarding gastric disturbance as the cause of an attack of migraine which subsides with vomiting." It seems entirely rational to hold that while the flatulence itself may not induce the attack, the conditions that caused the flatulence may alone be to blame for it; for the reason that correction of deep-seated disturbances in the processes of nutrition often possess the power of lessening or entirely removing the cause of the attacks.

All this leads to a belief in the importance of studying chemical pathology as a cause of epilepsy, a vast, prolific field as yet but little explored and still less understood. At the same time, we do not wish to be understood as claiming that the cause in such cases is never wholly centric, for minute, capillary hemorrhages, or small spots of softening due to thrombus or embolism or other lesions we are not yet familiar with, may act in the same way.

It is often difficult to determine *motorial* forms of auras from the beginning of the convulsive period itself. Indeed, as we have previously stated, auras of all kinds might very properly be looked upon as the entering wedge of the fit itself, notwithstanding that it may at times come and go without expanding into a convulsion.

We recall the case of a man, twenty-eight years of age, who had a persistent motor aura in a jerking movement that began in the right arm, just enough at first to lift the arm a few inches from his lap, but that grew stronger each time, the jerks being two to three seconds apart, until the arm was raised at each impulse straight above the head. So soon as this condition was reached, the jerking would commence in the left arm, and after it had gone through the same course, so that both arms were finally being jerked over the head at each impulse, a general convulsion would appear, the whole body being involved, the patient dropping unconscious to the floor. It required at times half to three-quarters of an hour for these motor manifestations to develop up to the convulsive point, a sufficient length of time to administer a remedy that often served to abort the attack.

One of the most common forms of motor disturbance is that of running just before the fit, the so-called Procursive Epilepsy. Cases that exhibit

* Vide American Text-book of Physiology, p. 458.

this phenomenon are rare, and as a rule are apt to be extremely violent during the attack. We recall the case of a boy who would start and literally run like a deer for half a mile before falling in an active convulsion, which was always followed by great exhaustion.

Another case of the kind was that of a young married woman, who seemed to possess superhuman strength from the way she demolished the stoutest woodwork when in a grand mal seizure, and who could not be allowed out of the hospital for a walk because when about to have an attack, she would run far enough away from the attendant to get lost.

When a seizure appeared while she was on the ward she would run at breakneck speed its entire length, about 120 feet, jump up and thrust both legs through the window and out through the spaces between the iron bars, remaining in this position until the worst of the convulsion was over, it being almost impossible to tear her grip loose from the iron bars.

Gould and Pyle (Anomalies and Curiosities of Medicine, p. 852) mention "a peculiar case of epilepsy, the patient being a workman who would be suddenly seized with a paroxysm and unconsciously run some distance at full speed. On one occasion he ran from Peterboro to Whittlessy, when he was stopped and brought back, while on another occasion he ran into a pit containing six feet of water, from which he was rescued."

Echeverria* described the case of a woman, twenty-two years old, who had general convulsions that always occurred in the day time, the attacks being preceded by an uncontrollable desire to run. If held at the time and violently shaken, the paroxysms would occasionally be cut short and their intensity diminished.

These "running fits" came on at the age of twelve years and grew steadily worse, until the girl's mind was practically destroyed. As a remedy, it was directed that "she try violent exercise at skipping the rope in addition to having a seton in the back of her neck, and being made to take large doses of the bromide of potassium and conium:" the author adding, "The perturbation caused by the violent jumping evidently proved of great avail. No fits repeated in the course of three weeks after commencing the above treatment joined to a tonic regimen."

The same writer mentions that violent exercise in a trapeze controlled the spasms in another patient; the patient resorting to the practice of his own accord in the belief that bodily fatigue would keep off the convulsions.

A carpenter's son, a young man of twenty-four years, of powerful physique, often showed the first evidence of an attack by suddenly springing into the air, sometimes with such force as to turn a complete somersault, generally falling on his back and head; immediately after which clonic contractions would set in, those being so violent as to require five to six strong men to hold him so that he would not injure himself too severely; but as it was, his body for weeks after an attack was often covered with sores, bruises and scars.

Other epileptics turn completely around one or more times before the attack comes on, the direction of turning being uniform; that is, if they turn to the left this time, they will turn to the left in subsequent attacks. Some walk backward a few steps, then fall heavily, striking on the occiput, repeating this often enough to keep an unhealing wound on the scalp at that point, unless a pad is worn to prevent it.

"Trembling from head to foot," as patients describe it, is witnessed in some cases, conjointly or not with an epigastric aura, while a feeling of "giddiness" just before the fit is comparatively common.

Isolated contractions of certain parts of the body, like the thumb or fingers, or the great toe, may also announce the coming of an attack.

A woman who came under the writer's care a few years ago, began at one o'clock in the night to have a series of convulsions that were checked after the eighth one, to recur six hours later, and that kept recurring 49½ hours, when 549 had taken place, the initial spasm each time being the sharp, clear contraction of the first phalanx of the right thumb. After the two hundredth seizure, the patient went into status, the temperature gradually rising to 107° F.; death occurring just at the beginning of the third day.

Some have a warning of an attack in "a sleepy feeling," somnolence. It is impossible for them to keep normally awake. This feeling may exist for a day or so before the convulsion appears, being exactly opposite to another state in which the patient feels "unusually bright and active, mentally and physically," for some time before the fit, to be plunged into painful dejection after it is over.

H. N. Moyer* reports the case of a young man of good family history, and correct personal habits until the age of fifteen years, when he became an alcoholic. At nineteen he was nervous, and had hallucinations during his waking hours—seeing strangely formed animals approach him several times. In 1895 he became afflicted with a tendency to sleep, so that he had frequently to lie down several times a day for the purpose—20 to 50—the patient himself states, sleeping only a few moments each time.

While running an elevator he would sleep while passing several floors. He had other attacks which he described and which differed from the ordinary sleeping attacks. "Once at the table he suddenly became unconscious, the attack probably being epileptic."

It is difficult to say to what extent, if at all, these attacks of somnolence may have preceded the lighter forms of psychical epileptic convulsions, but it seems probable that toward the last, at any rate, they must have been most intimately associated with the epileptic state. Complete obscurity at present surrounds the cause of these conditions. Clinically, the first appears to re-

* Epilepsy, p. 257.

* Medical Record, Nov. 19, 1899.

semble somewhat the so-called sleeping sickness that has been prevalent of late years in certain portions of Central Africa, and which investigators of the London School of Tropical Medicine seem to think is due to a low form of chronic meningitis. In this disease death invariably follows, which is not the case in the somnolent forms of epilepsy, *i.e.*, somnolent through the prodromal period only; the patient being as bright and as well as ever after the effects of the convulsion are over.

In rare instances the heart is the seat of disturbance that indicates an approaching attack, some pain, but more particularly a "feeling of distress" being felt in the cardiac region, palpitation being comparatively common.

When cephalic sensations are experienced, they are generally dependent upon the extension of an aura that had its origin in some other part of the body, like the stomach, though there is occasionally a sense of "fulness," or "a rushing sensation," experienced in the head or throat, altogether independent of any disturbance anywhere else.

In conclusion, my experience leads me to believe that the more sudden, severe and complete the epileptic attack, the less likely it is to be preceded by an aura, while the further the convulsion departs from the classical type, the more common and distinct the aura; and while at present we make but little use of these important initial manifestations of the epileptic state, they justify close and analytic study as contributing possible guides to the seat of the disease.

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## THE DAILY RHYTHM OF EPILEPSY AND ITS INTERPRETATION.

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THAT all force has a tendency to assume a rhythm is a fundamental postulate of physics (Spencer). Disease rhythm or periodic variations in the symptoms of general disorders has been an important factor in diagnosis and prognosis for many years. Some sort of rhythm attends all nervous processes both normal and morbid. This is a fact well proven by biological and psychological experimentation. Disease rhythm (not of muscle movements) in the chronic convulsive disorders is perhaps the most noticeable. This is particularly in evidence in the single or multiple tics, choreas, myoclonies and paralysis agitans. Their rhythmic variation are usually designated "good" and "bad" days. All forms of the insanities have well-recognized clinical stages of remission and exacerbation. As the pathology in the convulsive affections approaches nearly an organic basis in which parenchymatous and interstitial changes play the chief rôle, we must seek their principle of pathogenesis in an initial toxin or autointoxication. The rhythm of the pathogenesis must also be present and consequently fresh opportunities should be at hand for physiological chemists to grapple anew the many serum problems connected therewith.

The tempting field of wider amplitude of rhythm in the epilepsies as shown in the seasonal, menstrual in women and general meteorological variations, will not be considered here, but remarks will be limited to an exposition of the daily rhythm and its interpretations.

In 1897 (*Medical Record*, April 17) I collected and tabulated 9,545 epileptic seizures by hours for the purpose of determining the existence or not of a definite curve. In the compilation the early morning hour, four o'clock, appeared the greatest hour of frequency. The study quite contradicted the conclusions of Féré in a collection of 1,938 seizures from which he inferred that the eleventh hour was the period of least frequency; in mine, the hour before noon was the sixth in order of frequency. For this and other obvious reasons I determined to review all the data procurable and study the subject at great length. During the next four years I carefully collected data from epileptics of both sexes in three different groups comprising those of varying types of the disease who lived under dissimilar conditions and who were engaged in different pursuits. All the cases from which data was collected were under my immediate care and attention at the Craig Colony for Epileptics, at Sonyea, Livingston Co., N. Y. The sum total of the study comprises 150,000 epileptic seizures. The general manner of life at Sonyea has been excellently detailed by Drs. Peterson and Spratling at various times and need not be dwelt upon at length here. Suffice it to say that it is a country life adapted to the semi-invalidism of the epileptic class under hygienic regulations and control as regards occupation, diet, baths and medical treatment. Lest sedation might be considered as a hindering factor in the study with its well-known tendency to modify the rhythm in individual cases, I may say that the bromide treatment was at the minimum during a large part of the study, and in group three it was practically nil throughout the entire collecting period.

TABLE I.

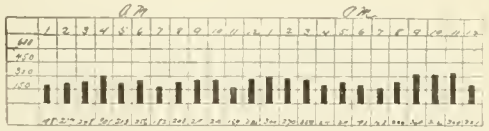

TABLE I.—An hourly analysis of 5,677 attacks occurring in about 25 epileptic men and women for a period of 18 months in the Peterson Hospital. Severe type of epilepsy.

Table I includes all attacks which occurred in the Colony Hospital for a period of eighteen months. A total of 5,677 seizures in an average number of 25 patients equally divided between two sexes. Serial and status periods are comprised herein, and it can be positively stated that every seizure of the twenty-four hours was cer-

tain of record, a fact of no mean importance and often overlooked in the heterogeneous collection of such data from private and unreliable sources. The character of the cases in the hospital was representative of the colony at large. All forms of epilepsy were shown. The character of the diet and hours of meals (7 o'clock A.M.; 12 noon; and 6 P.M.) varied but little from the institution proper, and consisted of light breakfast of cereals with weak coffee and bread and butter; dinner of soup, meat, vegetables and plain pudding; supper of bread and butter, stewed fruit, milk or weak tea.

The great majority of the patients were bed cases and the hours of sleep were from 8 P.M. to 6:30 A.M. The life for those not in bed was largely sedentary and unemployed; a few indulged in open air exercise. The data of this record would have been quite ideal for statistical study if no more serial or status periods were embraced in it than that chargeable proportionately to 25 patients, but every severe case of serial epilepsy and status epilepticus occurring at the colony is sent to the hospital for treatment. However, this data may form a legitimate part of the whole picture. In considering curves or maxima periods of frequency, we find three fairly distinct exacerbations ranging themselves: that of the early night or 9 P.M.; that of 4 A.M. or early morning; that of noon or 12 P.M. A tendency to the formation of smaller or secondary curves at 9 A.M. and 4 or 5 P.M. may here be noticed also.

TABLE 2.

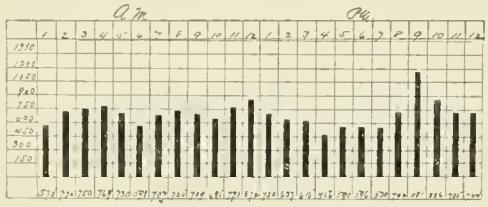

TABLE II.—An hourly analysis of 16,762 attacks occurring in about 40 epileptic men and women for a period of 3 years in mild type of epilepsy; the Letchworth House.

Table II is composed of 16,762 attacks occurring in about 40 men and women, equally divided, for a period of three years. The grade of cases were from the middle class of epileptics. The men were largely out-of-door workers on the Colony farm, and were of about the grade of those usually so employed at farm labor. The maxima periods appear similar to that in Table I, at early evening or 9 o'clock P.M., at noon, and early morning or 4 o'clock A.M. The more marked tendency to the formation of secondary curves in the early morning at 8 or 9 A.M. and in the late afternoon at 4 or 5 o'clock P.M. is also quite apparent in this chart.

Table III is made up of 18,494 attacks occurring in the idiotic, imbecile and demented male epileptics. They have no occupation and the life

TABLE 3.

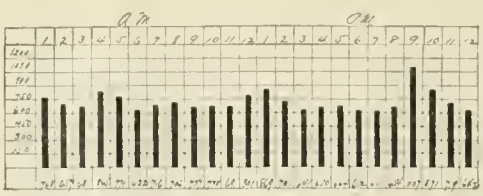

TABLE III.—An hourly analysis of 18,494 attacks occurring in 70 feeble-minded and demented epileptic men for a period of 18 months; West House Group. Severe type of epilepsy.

is a sedentary one. The maxima are similar to the preceding tables.

Table IV is a grand total of the different groups here given with a further accession of 110,067 seizures collected impartially from all the groups, thus making a sum total of 150,000 seizures.

A chart of about 40,000 seizures compiled from the women's group exclusively, was discarded as its accuracy was seriously in question. It was, therefore, not used as data in the sum total. I have no reason to doubt but that if it had been carefully compiled it would have presented the same general characteristics as that of those already given.

In Table IV the same general curve or maxima periods are present as in the preceding component tables. The hours or period of greatest frequency is that of the early evening or 9 P.M., and secondly, that of 12 o'clock noon to 2 P.M., and thirdly, that of 4 to 6 o'clock in the early morning. It is much less misleading to speak of the maxima as grouping themselves at a particular period rather than at a particular hour. If this be done we shall find that all the tables practically agree. The secondary curves become still more prominent in this last chart. The attacks are

TABLE 4.

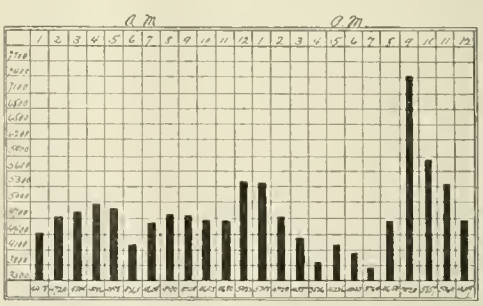

TABLE IV.—An hourly analysis of 150,000 epileptic seizures comprising the three preceding tables with the addition of 110,067 from all three groups.

quite evenly divided between day and night. It may, therefore, be stated that there does exist well-marked and fairly definite periods or rhythm in epilepsy. It is divided approximately into eight-hour periods with tendencies to the formation of secondary rhythm about midway between.

The maxima periods in their order of frequency are in the early part of the night, in the middle of the day and in the early morning.

I submit in explanation of the daily rhythm in epilepsy that we must consider in the first place the auto-intoxication, just as we regard the predisposition to epilepsy in general so must the auto-intoxication be reckoned with in the interpretation of the daily variation; in the second place, as the exciting agent or rather as a permitting factor of a negative sort, stands the lowered inhibitory control supposed to be a general function of the cerebral cortex in its totality.*

The lessened inhibitory control is expressed particularly in the degree of depth of sleep. In point of fact the seizure curve at night may be taken as an inverted curve for blood-pressure, depth of sleep and cerebral inhibition. Probably the diminished blood-pressure and the cerebral anemia supposed to occur in deep sleep are coincident and contributing factors to the sleep state.

Sleep, which is the diastolic phase of cerebral activity, is deepest in normal individuals the first hour or one and three-quarters hours (Minninghoff and Preisbergen) after retiring; it deepens at first quickly, then more slowly; it then lightens and remains indefinitely light; an hour before waking it is very light, nearly as light as the first part of the night. There is a final deepening but of course not so marked as that seen in the first sleep at retiring. Sleeping deeply implies literally sleeping down through all the level or neuron orders. In deepest sleep I have never been able to obtain knee-jerks and plantar responses except by such severe stimuli as to awaken the patient. In the reverse process of awaking the lower reflexes are released first and may on stimulation be made to overact. This is in brief an epitome of our present knowledge of the sleep state and the reflexes.

Physiological and morbid crises occur frequently in the light sleep periods such as nightmare, night terrors, nocturnal emissions, somnambulism and epileptic seizures. The fact that the individual passes into deep sleep rapidly on first retiring discourages the occurrence of the crises just mentioned, nevertheless I found in extended observation upon certain cases where deep sleep does not quickly occur and where it remains indefinitely light in the early retiring period that epileptic crises of varying degree of severity and frequency occur. The return to light sleep after the first period of deep sleep is comparatively speaking gradual and consequently permits the occurrence of the highly organized cerebral reflex process of epileptic seizures. However light the sleep the cerebrum which is the seat of the general function of inhibition is in abeyance and in result permits all reflexes (literally not asleep) to run riot. This theory explains also the early morning frequency.

It must be distinctly understood that the negative state of cerebral inhibition in the light sleep periods does not cause anything, much less the occurrence of epileptic seizures, but permits their occurrence by letting go of the normally inhibited lower reflexes. Epileptic seizures are a sensory-motor reflex, comparatively high grade in character as they are functions of the cerebrum itself. The auto-intoxication must be the active agent in its excitation. I cannot but believe that the modifications in the condition of blood-pressure cardiac and respiratory activity, body temperature and secretory variations are but coincident factors to the sleep state and dependent upon it rather than the reverse. They all may and probably do contribute their share in the general occurrence of the climax of auto-intoxication.

The explanation to the noon frequency is more difficult than the night rhythm, as in the latter case the external conditions are largely at a minimum. However the noon frequency may be explained as follows: The patient is fatigued and inactive for the first time since awakening. This inactive period may properly be termed day sleep; it is a time of day dreams and is quite comparable to the light sleep during the night. Then, too, this period, 12 to 2 o'clock P.M., is the time of ingestion of the heaviest meal of the day. Epileptics have a well-known tendency to eat hurriedly and to bolt their food. The fact that the food is not properly masticated is a great fault, but in addition bolting and eating hurriedly makes the act of swallowing frequent, and this act is a well-known source of exciting an epileptic seizure. The factor of overeating must not be overlooked in explaining the frequency of seizures at the time. The excessive degree of auto-intoxication at this period more than compensates the moderate degree of cortical inhibition still present and not in evidence in the early morning hour period.

The hour before retiring is the period of least frequency (7 P.M.), and this is quite in accord with the well-established physiological law of "good feelings" at this time and particularly the inhibitory control shown in the insane in which, on the eve of recovery, the first lucid periods occur at the hour before retiring (Clouston). The application of sedatives at the periods of greater hourly frequency invariably causes a false period to be established if sedatives alone are employed. In addition to the bromides the treatment must be to eliminate and subdue the initial causation.

Epileptics do not meet with serious accident while earnestly occupied, or, at least, not until such occupation becomes unconscious or largely automatic in character. That idleness and indifferent occupations are to be discouraged for epileptics is well known; work should be simple in character but not monotonous.

Epileptics rarely need hypnotics but are nevertheless light sleepers especially when not under great sedation. They are subject to frequent disorders of sleep and particularly liable to be great dreamers, an index to the soundness of sleep. Chloral and its allies owe their beneficial effects

* Probably, for many reasons this function is in the possession of the second layer type of cells, so-called sensory layer.

in the nocturnal types of the disease more to a hypnotic effect than as a cardiac and vascular depressant. The bromides, the exact action of which in the epilepsies is not known, however, we know they diminish the afferent impulses to the motor cells in the cortex and therefore aid inhibition.

To recognize the existence in general terms of a daily rhythm in epilepsy is of practical importance for obvious reasons, and especially to those with whom the care is immediately entrusted; particularly for guarding against accidents and injuries at those periods of greatest liability for attacks. This suggestion has most value for epileptics without known periods of liability to attacks. The agents that are employed to arrest or delay attacks are as much of our common experience as are their general inutility when indiscriminately used even when a sufficiently prolonged aura presents itself. We must, therefore, continue to insist upon a broad, comprehensive, carefully detailed, continuous plan of treatment, however empirical at present it may seem to be.

To summarize.—This study of 150,000 seizures shows that there is a more or less definite daily rhythm in the epilepsies, in the early evening, noontime, and in the early morning, which roughly divides the 24 hours of the day into eight-hour periods. There are also smaller or secondary rhythms.

The interpretation of the rhythm is explained on the basis of cerebral fatigue and the accumulation of waste products at these periods which produce auto-intoxication and which in turn exhibits itself in seizures during light sleep and during the day when the loss of cerebral inhibition is greatest. Secondary and contributing factors are: manner of living, diet, exercise, occupation, sedatives and the character of the epilepsy.

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## ON THE PATHOLOGY OF EPILEPSY.

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All our knowledge of human reactions, and so far as that goes, of practically all biological reactions, is symbolic and relative. We can study various types of reactions and learn to distinguish them, and find the conditions under which the reactions take definite forms; but we cannot understand them as we understand the striking of a clock. We can learn to build a clock and to see how point by point, wheel by wheel, the parts are brought into connection and that the work of a spring and perhaps the regulation by a pendulum bring about the definite result. In biological observation the data of organization remain an ever-puzzling question. Experience of physics and of chemistry furnish the material for *analogies;* perhaps they actually explain certain components of the whole reaction, as the theory of statics and mechanics explain the working of the joints. But behind it all we see that the entire equation is made up of many unknown factors, among which the known principles play a very modest part. This is natural enough. All knowledge is the result of analysis and rearrangement of experience and our theoretical sciences are made up of what is most easily analyzed and compounded again in experiment, and that mostly on materials which are used for technical purposes. As soon as we leave physics and chemistry and step into biology, many x's and y's of our equations become irreducible and all attempts to ignore this and even to make electricity or the more modern theories of osmotic pressure, or the yet more modern combination of the two a panacea of explanation of biological facts, leave something like a bad taste of unripe fruit.

We can, of course, make absolutely correct calculations even if we assume the living being to be an unknown but definite quantity and introduce into the equation merely such factors as are actually understood in their relation to the rest of the total being and its manifestations. The usual blunder is that we put some physical or chemical factor into the equation without considering that we really invade and change the first which is no longer quite identical with the biological entity without the reaction which we single out. Thus we hear uric acid spoken of in relation to epilepsy almost as if it did not belong naturally to our economy, and as if we knew all about it in a large number of people.

Of all calculations in pathology, those on epilepsy have proved most elusive. Its chief manifestation, the convulsion and its equivalents, is as puzzling to the physician as it is fear-inspiring to the layman. Theories of its nature have been attempted and we have many names for them. The fact is that it is as little open to an absolute understanding as any other, even the simplest, "spontaneous" motion. We must take it just as one of the *types* of puzzles of largely spontaneous motion and be contented with establishing as far as possible, the conditions under which it occurs. In this respect, there is indeed a great deal that is worth knowing.

The first fact is that it is possible to recognize many types of manifestation of this kind of puzzle, and that some types belong more closely together, so as to form distinct natural groups with definite conditions. Thus ordinary observation allows us to distinguish epileptiform conditions from so-called idiopathic epilepsy; but distinctive marks which would point to the special origin of the type are often enough absent. If we had time for a broad review we should have to draw into our scope of analysis: subagonal twitchings, especially of animals; the convulsions of children, called eclampsia: the results of mechanical or electric excitation of the nervous system, which vary in the different animal species. A special type can be produced in the guinea-pig and in these according to some observations is even directly transferred to the young; temporary convulsions are variously produced in higher mam-

mals; differences depend in part on the architecture of the nervous system of each species; in line with these we mention the focal irritations by special lesions in the brain of man, either focalized as in trauma or tumor, or more diffuse, as in general paralysis, etc. Next we have the group of toxic convulsions (alcohol, absinth, ammonia, uremia, and diabetes). Further, the convulsions in hysteria and in catatonia, in part of psychic origin. There is finally left a large group, not further analyzed, the idiopathic epilepsies.

We see from this that convulsions are a very common form of neural action. Its study as a neural action is a dry field, but all the more important for the discovery of distinctive diagnostic types. The description of these facts properly belong to the clinician. Important positive and negative facts are brought forth by the autopsies, mostly in the direction of localization of so-called provoking lesions, or showing what we must consider effects of epilepsy, or pointing to special constitutional peculiarities. A combination of the clinical facts and the anatomical evidence together is needed to form the material for a pathological consideration, for a digest and if possible experimental investigation of the nature of the disorder and the conditions in which it appears.

Owing to what seems to me, a short-sighted way of looking at the facts, the evidence from the autopsies is looked upon as more than manifestations of the disease, as directly demonstrative of the nature of the disease. Yet nowhere more than in epilepsy do we find the need of a more modest sizing up of the anatomical facts. They are not any more nor less "pathology" than the other manifestations of the disease, usually called symptoms. They are morphological symptoms and in order that we shall get at the nature of the disease, they must be classed with the symptoms for what they happen to be worth, and the deductions must come from cautious elaboration of all the facts, if possible with experimental proof of the conclusions.

As a concession to the current manner of division, I briefly state what morphological facts we have: In a large number of cases there are lesions in the nervous system. Among these many of those of the cerebral cortex are most probably points from which the "discharge" begins, so-called provoking lesions, many of which can be diagnosed in life. There are, however, cases of so-called idiopathic epilepsy in which such provoking lesions are found only post-mortem, so that any cautious observer will refrain from supposing that during life it is possible to distinguish all the cases with a provoking lesion from others which would be idiopathic, unless one has a very accurate history. By far the largest number of findings are, however, more probably incidental, not directly provoking lesions, or at least not primary.

From my autopsies[1] I mention as provoking lesions which were not diagnosed during life: a case with a pea-sized calcareous nodule in the pia of the Sylvian fossa, probably a residual of a tubercle; and a case of moderate hemiatrophy of the brain; further two cases of senile epilepsy with very small cortical foci of softening. More usually the primary lesion was diagnosed and accounted for by the early history of the patient, as in a number of cases of infantile hemiplegia and traumatic epilepsy.

Besides what might thus be called primary lesion—a disorder existing before epilepsy broke out or with which epilepsy came on—there are frequently small foci of softening in the temporal lobes, sclerosis of the cornu ammonis, an occasional glioma of the temporal or occipital lobe, remnants of contusions of the pia, and not infrequently fresh ecchymoses around the temporal lobes, after a status epilepticus, *i.e.*, effects of the frequently violent falls and the like. The rôle of the sclerosis of the cornu ammonis is not easy to decide; but there is no doubt that it also occurs with general paralytics with severe attacks,[2] and rather too often in epileptics who have other certainly primary provoking lesions. Summing up the facts about coarse lesions, we must admit that we know of no lesion which inevitably causes epilepsy; nor of any sufficient reason why the one lesion should and another should not, except that lesions which imply frequent irritation are most apt to be epileptogenous, especially adhesions of the convexity.

Histological findings of the brain yield little that could be called causative. The occasional gliosis of the cortex discovered by Chaslin and Bleuler, and corroborated in some cases by Alzheimer,[3] Weber[4] and others, and the nuclear changes shown by Bevan Lewis, are not explicable, except as a secondary condition. Summing up the general pathological evidence furnished by anatomy and histology of the nervous system, we find that in a certain number of cases we may say that the patient had a sufficient morphological cause for epileptic attacks of the nature of a provoking lesion, and that in some cases dementia is accounted for by gliosis or secondary lesions. But in no case can we say that the patient must have had epilepsy, or with more than some probability what the attacks were and how often they appeared and with what influence on the mental and physical conditions.

Post-mortem evidence of a very interesting character and probably coming rather nearer what is needed for the explanation of the epileptic constitution, is furnished by Ohlmacher.[5] His finding of a persistent thymus and of the lymphatic constitution cannot be accidental, but are difficult to assimilate directly with an explanation of epilepsy as a whole. It would suggest the eminently constitutional character of epilepsy. The lymphatic constitution as such remains to be explained, as well as rachitis which Ohlmacher makes responsible. We further refer to the frequent recurrence of the statement that the large blood-vessels were found abnormally small.

From the observation of patients during life, a wealth of facts awaits digestion: The evidence of constitutional peculiarities and their explana-

tion including especially functional traits, such as Sommer's[6] interesting demonstration of characteristic tremor-curves even between the intervals, the many types of convulsions and equivalents, including irritative, inhibitory and paralytic symptoms, the manifestations of metabolism, and the condition of the blood and urine, and the peculiar reactions to dietetics, therapeutics and other more or less experimental influences such as serum therapy.

If we understand by pathology the digestion of all the facts of observation, clinical and post-mortem, and the further analysis and, if possible, the demonstration of the correctness of the inferences by experiment, we can naturally not attempt a summary in ten minutes; but I wish to point to some of the researches of the last five years, which are most fundamental, and if not explanatory of epilepsy, as such, marking a progress in our knowledge of the mechanisms involved.

1. The neurological side. Prus[7] shows that cocainization of the cortex makes fits by electrical stimulation impossible, so that he concludes the stimulation of sensory elements of the cortex is essential to start any fit. He also furnishes what seems to be a key to the many discrepancies in the experimental study of the fit in animals. He points to many irregularities in the irradiation of the discharge over the cortex and shows that not the pyramidal tracts, but the tegmental motor paths are the carriers of the impulses from the cortex to the segmental nerve-complexes.

This is one of the facts which is bound to change our schematic views concerning the pyramidal tract and make intelligible the claim that the tonic spasm of epilepsy is produced from irritation of the tegmentum of the midbrain and pons; evidently v. Monakow's tract is involved, and the whole mechanism to which it belongs.

But even with this elucidation, we are not carried beyond the long recognized conception of Nothnagel and others that only in a small number of cases is there a sufficient cause for the attacks themselves (as after injection of absynthe or in uremia or diabetes, or after deep faradic stimulation), and that for the ordinary epilepsy with or without a provoking lesion, we must accept a special disposition for convulsive discharges, very general in infants, but more limited to the epileptic in the adult.

The idea of Kocher that the epileptic attack is due to intracranial pressure is refuted by Bier,[8] who did not produce fits by sudden increase of the pressure by temporary strangulation, even of epileptics.

2. The second line of research is that of the relation of metabolism and fits.

This is the line to which most attention has been paid during the last few years. I do not belong to those who consider optimism about pathological chemistry and its prospects in general pathology necessarily premature. But I am equally sure that by far the larger part of chemical research concerning epilepsy operates with very small safe substance in a very large equation full of unknown quantities. And the worst of it is that the methods available seem to be open to so many errors. The literature is unbearably tiresome and contradictory and the results far from encouraging. There is hardly a substance in the urine which has not been made the beast of burden of the great puzzle of the sacred disease. Remarkable constituents have been isolated and in one especially advertised instance they were ultimately found to be simple ammonia; dietetics have been invented by the dozen, animals have been injected with doubtful substances by the hundreds; and it would seem that the more work there is, the more confusion. Wherever I turn to conscientious physiological chemists, I meet with reserve and frank admissions of ignorance, and frequently with much evidence which goes against the justification of the methods used.

With all these reserves, I consider research in this line worth undertaking, even if it were merely to get the puzzle out of the way. The following summary gives some idea of the type of work. Most of the investigations are one-sided. Matters which to one writer seem all important are found not to be considered at all by others who again extol their own hobby. The reason for it all is that the work involved for a complete quantitative estimate of metabolism goes beyond the amount of work which the dilettante can give; and if anything fundamental is to be gained, it must be put into the hands of sufficiently equipped research stations.

Most of the investigations turn around the nineteenth and twenticth century editions of humoral pathology, the theory of autointoxication. We may classify the studies into those with chemical analyses, and those of simple toxicity, and finally those of the possible production of antitoxins.

The numerous experiments of toxicity by the French and Haig's claim that uric acid is retained, gets into the blood and produces the attack and is then eliminated in larger quantities, prompted Krainsky[9] to study the metabolism of a number of epileptics. He found that when the daily amount of uric acid is 0.6 to 0.8 grams, there is no attack, but a fall below 0.45 is usually followed by an attack. Means favoring the excretion of the uric acid have, however, no influence. The amount "retained" is usually made up for after the attack. Couvreur[10] found some such relation in only four out of ten cases. The diminution may be noticed three to five days before the attack, but the amount may sink below 0.4 or even 0.35 without a fit, or fits may come on without a diminution below 0.4. If the deficiency is made up for at all, it usually takes several days. Caro[11] corroborates Krainsky's findings in his case, while Putnam and Pfaff[12] did not in their two cases.

Apart from the curve of uric acid and phosphorus Krainsky saw no regular correlation with the disease-curve. Galante[13] found, however, a regular appearance of 0.05 to 2 per cent. of albumin after the fits and a parallelism of this albumin with amounts of indican.

The chief hold for the autotoxic theory was

the experiment with injection of blood and serum from epileptics. Krainsky had positive results on rabbits and incriminated carbamic acid. Binswanger failed, and since then the majority of the conscientious experiments of Herter,[14] Roncoroni,[15] and Bratz and Hebold[16] have discredited the early claims of the French writers. Bratz and Hebold even made their injections on animals from alcoholized parents and on a dog with a brain-lesion without any typical result.

Concerning the toxicity of urine we can practically say that the injection test is as contradictory as it is of doubtful bearing. We know how difficult it is in man to establish satisfactorily the mode of death and how many precautions are necessary. In the animals of which we read the report of death after injections, there is hardly an intimation of an effort at a careful autopsy, and no sufficient evidence for the nature of the influence of the injected material.

It would seem quite fair to-day to say: With the attacks of epilepsy go expressions of an abnormal state of equilibrium, evidenced by malaise and abnormal metabolism. Auto-intoxication is not demonstrated. The facts taken for evidence of autointoxication are not linked in a convincing causal chain. The explanation of the occasional toxicity of urine and blood for animals is still wanting, and the occurrence altogether too irregular. It is suggested that it might be as well the mere expression of the condition during and after the attack and not the cause.

This negative attitude may be surprising in the face of the assurance of the latest phase of research on epilepsy represented by Bra[17] (who has found his neurococcus before and during the attacks of epileptics and has produced convulsions and death in status epilepticus in rabbits by the subcutaneous injection of the cultures), and the enticing communication of Ceni,[18] which is probably all the more fascinating because it seems to give therapeutic promises. Injections of serum from epileptics have been found by him to reduce the number of attacks in six cases, to cure two relatively recent cases, while two cases got worse. His theories, which are merely a transcription of his empirical results—are easily accessible and require no repetition here. Time will show how they will rank in the light of longer series of observation.

Somehow all therapeutic procedures in epilepsy have demonstrated a remarkable psychic factor, which always bring to my mind the experience of Dr. T. H. Gage, in Worcester, who, after his fifty years' connection with the two hospitals for the insane, has given me some very interesting accounts of the temporary influence of optimism on the part of physician and patient in various waves of new treatment in epilepsy.

We can say now that epilepsy is a disease about which there is a large material of safe empirical facts. Their use has led to a remarkable improvement of the condition of epileptics and their management, and if we wish to properly observe everything that is empirically established, and a guide for action, there are even now good chances for better utilization of what we know.

From an explanatory point of view, pathology, or scientific medicine, has added little and it does not seem to give much immediate promise. The factors, the remote etiology and the constitutional proclivity to epileptic discharges, are not very accessible to the young sciences. It is all the more necessary to lay a good foundation of carefully collected empirical facts to give a good balance to what scientific research is undertaken. I cannot suppress a feeling of self-reproach which ought to be of some use to those who direct the management of epileptics. Epilepsy is a huge field and requires an excellent system for conscientious and exhaustive observation. In my crowded clinical work, the epileptics have rarely found that exhaustive attention which they ought to get. Even in the autopsies where hurry is not the rule, I must have overlooked many things to judge of the percentages shown by men who were looking out for points of special interest to them. This makes me inclined to think that momentary interests are likely to make observation one-sided and surely put the patient at a disadvantage. Only a very systematic arrangement of the work will avoid this. With this in view I conclude.

1. The frequency of nervous lesions in epileptics is difficult to establish. The ordinary examination is too open to oversights, and must be very systematic in order to justify the verdict of negative findings. The great variation in the number of sclerosed cornu ammonis, diffuse gliosis, small foci of softening quoted by various authors, is certainly to a large extent an expression of variable attention, a picture of the psychology of investigators rather than of the distribution of facts.

2. Concerning the chemical investigations, the same psychological factor of personal interest is even more deleterious to a fair comprehension of the facts. The truism that observation of the rules of hygiene in every direction is a great factor in the management of epilepsy, is decomposed into innumerable currents of interests. Nothing short of unprejudiced and complete series of investigation will help us here, and also a much greater conservatism with complicated methods such as the tests of toxicity, the results of therapeutics, etc.

3. All these conditions are difficult to attain except in sufficiently equipped institutions for which funds should be made available by the State, and by scientific corporations, so that they may work free of the need of sensational results, create a sound basis in clinical work and systematize the investigation according to methods which can be admitted as safe and fruitful.

To what extent this had best be carried, is a question requiring much judgment. The one thing is certain—and every move in this direction should receive credit and encouragement—that institutions should be given a chance and should even be put under the obligation of doing justice to medical observation, of promoting the medical

interests of its physicians and of laying a good foundation of experience, such as the isolated practitioner can never get for himself. On such ground, more delicate investigations will find a healthy soil.

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## THE LEGAL AND SOCIAL STANDING OF THE EPILEPTIC.

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AVOIDED by man and seemingly forgotten of God, the epileptic of all humanity is the most pitiable and the least pitied. Periodically beyond self care, often dependent upon his fellows for the preservation of his body, ever haunted by the awful doom that blights his very soul, he cannot see even a silver fringe to the cloud that obscures his life. Yet we of the law ignore him, letting him pine in prison or perish on the gallows; we of the pulpit draw our cloth closely to avoid contact in passing him; and worst of all, we men of medicine gaze a moment then turn away muttering, "hopeless, disagreeable to handle." Surely fate has done its worst when it casts the net of "falling sickness" upon mortal whether man or beast. It is our simple humanitarian duty to loosen the knots of that net.

The conditions we face are these: (1) Legally the epileptic is held rigidly responsible unless by rare change he proves irresponsibility at the specific time; (2) socially he is held to hard and fast responsibility, consequently ostracized; (3) the few who have studied him intimately know that morally he is practically always irresponsible.

Now let us see what the law has done toward lightening his burden of existence. In the Eastern States of our Union he has been studied and his condition is beginning to be somewhat understood and occasionally allowance is made for him in courts of justice in arriving at an equation of moral right and wrong. We say occasionally, advisedly, for the mental aberration must be self evident, else the unhappy victim becomes yet further accursed as a social scapegoat. Very often even here in our learned East does the law see the criminal in mirage where the patient exists in reality. In the West and South more haste and less justice is seen. There the lunatic sometimes gets deserts; the epileptic rarely if ever. It takes wealth with its settled conditions of learning and culture to make liberality; further there must be a high average of intelligence to be liberalized, else wealth itself will prove impotent. In the hurried civilization of the West, and in the South with its generation of social revolution, added to its terrible incubus of negroes, the quiet deliberate justice of the East is yet impossible. Hence the greater responsibility rests upon the East in experimenting, trying and weighing till basic conditions are reached and precedents set.

What a blot the present status is on our civilization. We think of our fathers as inhuman for stoning the leper, our children will think of us as cruel and point to our dealings with the defective, especially the epileptics, as an example of man's inhumanity to man. Only two States in all this land of lavish liberality and boasted enlightenment offer sanctuaries for the refuge of the most helpless, hopeless and unhappy of their defective children. All other States say in effect, "become either a criminal or a lunatic and then I'll cheerfully assume your burdens, but as a helpless, hopeless epileptic I'm not concerning myself about you. I'm not trying to save you while there is yet chance of making you an economic factor, however willing I may be to preserve you as a social ulcer." Is there in all this realm a harder fate or a fate more hardly dealt with?

When that lowly priest in the valley of the Rhine offered himself to be the Moses of this most benighted section of humanity he put to blush the charitable world and soon had blazed the way for the truest benefactory legislation ever graved on statute books. He and his flock have treaded a path, tortuous and stony in places it is true, to the elysian field of comparative contentment. And the sight of those anxious social outcasts crowding to his hearthstone and tapping at the door of his heart crying "Save me ere I sink," makes one of the most pathetic chapters in all the history of suffering humanity. At his fireside they found warmth, and in his heart they found devotion in such generous measures that their frozen natures were warmed till they became all but happy. Not happy, no, for Jove in anger at the murder of Iphitus swore that neither Hercules nor any of his epileptic ilk should ever reach that. Mentally astigmatic, spiritually strabismic, the clear straight rays of happiness are for him distorted.

Even after Bielefeld had thrown its enlightening rays on the world for nearly a generation, Ohio as a pioneer took cognizance of the epileptic not as such but as a lunatic, and founded a separate asylum not as much for his care and his pleasure as for the *comfort of the other lunatics.* Think of it, because the insane epileptic was an unpleas-

ant associate for the maniac was he segregated! Nevertheless he became the recipient of a disguised blessing, for the action of Ohio put alienists and neurologists to watching and thinking, culminating in the genius-like flash, that brilliant patch of sunlight, Sonyea.

When New York State founded for sane epileptics Craig Colony from the public treasury, and maintained it by public taxes, the millennium of charitable legislation seemed nigh at hand. There the epileptic and not the lunatic is cherished and studied and remodeled for a scientific problem.

As a result of all this awakening we will ere long see the scales of justice balance even with an epileptic in one pan. It will not rest then with indifferent juries, but the expert guided by definite standards will say when justice is satisfied.

But as yet we are many, many rounds beneath that supreme height, and frankly stated our standing ground to-day is this: New York and Massachusetts, only, recognize the helplessness of the epileptic and extend to him an official hand ere he sinks hopelessly into insanity. Among nearly all other peoples he is simply a disagreeable person, a crank, a pauper, a lunatic or a criminal as circumstances seem to indicate. He is a veritable briar in the social rose garden, an incubus on his friends, a blight on his family, a burden to the community, an annoyance in hospital or asylum, a black beast in prison. No wonder he is such a nightmare in the courts of justice. And doubly strange it is that no real scientific and concerted action to bring order out of chaos has been taken by our medical fraternity. Why is it that precedents have not been established for future guidance?

An epileptic who commits crime should be deprived of liberty during the continuance of his disease, but he should very rarely, if ever, have the stamp of convict placed upon him, for the convict should be a criminal by intention, while the epileptic should be presumed to be irresponsible, therefore incapable of criminal intention till clearly proved otherwise. As the law by omission, and practice by custom, now stand he is presumed to be responsible till proven not epileptic but insane. How unjust, for while the epileptic state lasts it constitutes one of the very worst types of mental unbalance but being often of short duration with clear intervals between attacks the public and the bar, yes, and often the court, fail to grasp the idea of periodic actual mental irresponsibility. In the eyes of the law this means inability to distinguish right from wrong at the time of examination or trial and not often at the moment of the overt act. The test of mental irresponsibility really ought to be not the faculty of distinguishing right from wrong, but the power of resisting wrong as opposed to right. We know that the epileptic may be totally vacuous mentally this minute and markedly alert the next. That statement is patent to those who have studied him intimately, but apparently incomprehensible to those who have thought nothing of the problem.

It is indeed a hard fate that the epileptic must suffer all the damage of the insane, bear the cross and show the hall marks of insanity, and yet wear the convict's stripes. But such is the fact to-day. The next generation will see that changed. The law will require their segregation, but not convict imprisonment.

Black as the legal status has been painted, yet darker coloring is needed for the finishing of the social picture. Ostracized becomes a light word, outcast but little worse, despised is more fitting. The family hides him from the world, keeping this awful skeleton well closeted, and where possible leaves him to the tender mercies of hirelings.

The epileptic as a rule is not an attractive personality, usually wearing in face and figure, in the very atmosphere about him the trade-mark of the most unfortunate. Careless in speech, prone to exaggerate, illogical in conversation, irritable in controversy, erratic in ideas, he makes an all round disagreeable comrade. Suspicious, improvident, forgetful of the past, indifferent to the present, careless of the future, he makes an utterly undesirable friend. As the preacher's protégé he causes the ministerial heart strings to tighten; as a client he provokes his lawyer into losing faith in humanity; as a patient he all but forces his doctor to dislike his calling. Not welcome as a private guest, not wanted in public gatherings, even his own family holds its conferences without him. The confidant of no one, in close companionship with only his own perverted imaginings, no wonder in brooding over his fate he sees the world all against him. Truly the thorn and not the petal of the rose, the burr and not the down of the thistle, go to make his couch.

We ask each other over and over again if there be a remedy for all this? No, the very conditions say there is not. The best we can hope in the reasonable future is amelioration and that will come by segregation in colonies of course. There he can be suitably clothed and fed, humanely treated, and his energies directed into profitable as well as congenial channels, thus minimizing the curse of his disease. The very nature of his disease makes him a social incubus and our efforts should be to lighten the weight of his burden.

His moral irresponsibility is a fact beyond controversy, for his acts are at times purely automatic; nor is this state brought on by his volition. Therefore, it becomes self-evident. Because of the ofttimes similarity between alcoholic and epileptic stupor, the public fails to make the necessary all-important distinction. That difference is this: the inebriate is mentally but not necessarily morally irresponsible in that he voluntarily induced his stupor. The epileptic's stupor is involuntary, hence completely obliterates his moral as well as mental responsibility.

We can place the average epileptic in worldly setting as follows: forbidden socially: unwelcome in court except as criminal or lunatic. Truly this disease puts the porcupine's armor on its unhappy victim. He becomes a veritable noli-me-tangere, neither man nor beast approaching him unscathed.

If Nirvana be a reality, if there be a dreamless sleep with no awakening and rest eternal, let us not begrudge him it, for surely happiness will not come nearer.

In a little corner of this chaotic picture of melancholy figures let us remember to place the sweet placid face of that rarest of individuals, the contented, almost happy epileptic; whether that contentment be a water mark of insanity or whether the heart has been touched by a love higher than human we can never tell. But we all who have dealt much with the epileptic have seen one or more of these pitiable, pitied, lovable and loved characters. I have been told that at Bielefeld and Sonyea one sees many of those faces; if that be true let this Association rest not, nor look backward, till every nation and every State may point to such a place as its chief ornament.

## THERAPEUTIC SUGGESTIONS IN DIPHTHERIA.

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The specific treatment of a case infected with diphtheria consists first and foremost in giving it *the required dose of antitoxin.* The dose depends on the severity of the infection. The usual amount required for a very mild case, of a child from one to five years old is 1,500 units. If there is no effect noticeable within twelve to twenty-four hours then the second injection of the same quantity should be repeated. A child five to ten years of age should be given at least 2,000 units at its first injection to be followed in twelve hours by another injection of the same dosage if there is no amelioration of the symptoms.

When we are dealing with a severe toxemia with marked general depression and large pseudomembranes in the throat, then at least 3,000 units of antitoxin should be injected in the beginning. When the cervical lymph glands are enlarged and there is slight or severe evidences of stenosis then at least 3,000 units should be injected in the beginning.

*Indications for a Second and Third Injection of Antitoxin.*—If twenty-four hours after the first injection there is no visible effect on the pseudomembranes, if the child is not brighter, if the appetite is poor and if the heart's action is very poor, in other words if there is no visible improvement, then by all means inject a second dose of antitoxin.

The necessity for the third injection depends upon the pulse, temperature and the condition of the glands of the neck, also upon the macroscopic condition of the throat. If no improvement exists then the third injection is imperative.

*Laryngeal Stenosis.*—It is always a safe plan to give a large injection of 3,000 units and if the stenosis does not disappear in twelve hours, then I give an additional injection of 1,500 units so that in all 4,500 units can be injected during the first twenty-four hours.

The above treatment with antitoxin will be serviceable when we are dealing with a pure Klebs-Loeffler infection, but there are a great many cases in which this is not so.

*There are contributing factors leading to a fatal termination.* First and foremost is the presence of the streptococcus in addition to the Klebs-Loeffler infection. In these mixed infections we have in addition to the general diphtheria, a distinct streptococcemia. In these cases antitoxin is inert as regards the streptococcus. We frequently have bronchopneumonia, nephritis, arthritis, otitis, and local abscesses due to the invasion of the streptococcus. To neutralize such mixed infections we require besides the Klebs-Loeffler antitoxin a streptococcus antitoxin or a potent antistreptococcus serum.

*The bacteriological findings will therefore be the guide in the future in determining, first, whether a culture from the throat shows a mixed or an unmixed infection and in addition to this bacteriological examination, the blood must be examined to determine the presence or absence of a streptococcemia. The treatment must be based on scientific data, hence, it should conform with the result of what is found by culture from the throat and by the thorough examination of the blood.*

If we can inject a sufficient quantity of antitoxin to stimulate cell activity and neutralize general toxemia, then we give our patient the greatest opportunity to eliminate this deadly poison and to begin convalescence.

*The ordinary shortcomings* that are most frequently met with consist of, first, placing too much reliance on the specific nature of antitoxin regardless of other vital necessities. In this infectious disease, where there is marked leucocytosis and other evidences of subnormal hemic conditions, the *indication next to antitoxin is for restorative treatment.*

*Mouth Feeding.*—As a tissue and blood builder *no medication equals food.* It is, therefore, imperative to support the general nutrition by proper feeding. Milk diluted with some cereal decoction, like oatmeal, barley or rice will be better borne than pure milk alone. Sometimes it is necessary to partially peptonize to render it more absorbable. If the child is old enough the yolk of a raw egg can be added to the milk. Concentrated beef broth, chicken broth, clam broth or oyster broth should be thought of. When feeding, once in three hours, it is a good plan to give some of this concentrated broth, followed in three hours by a milk feeding, and so alternate. In this manner we give our patient milk once in six hours. Acid fruits, such as oranges, lemons, grapes and cranberries are very well borne. When acid fruits are ordered they should be given an hour before milk feeding. Older children can be given raw scraped steak, calf's foot jelly, and ice cream which is nutritious and pleasant. When it is *difficult to feed by mouth* owing to excessive vomiting or to anorexia, or where intubation has been performed, then it is a good

plan to let the stomach have absolute rest and to depend on

*Rectal Feeding.*—No more than two ounces should be injected at one time.

Milk, predigested, ..... 1 ounce
Starch water, ..... 1 ounce
Laudanum ..... 1 minim

To be injected slowly through a colon tube, after both colon and rectum have been cleansed by a soap-suds enema.

If the small nutritive enema is well retained then we can repeat the injection once every four hours, and add the yolk of a raw egg to the above formula of milk, starch and opium. Next in importance to giving the proper dose of antitoxin is the nutrition of the body which has just been considered. To assure proper assimilation of food requires attention to the bowels. The elimination of toxic elements can only take place by means of the bowels, kidneys and skin. Normally in febrile conditions there is a general torpidity of the emunctories. Thus it is apparent that a dose of calomel, citrate of magnesia or an alkaline solution like the milk of magnesia or a laxative mineral water, will aid in the performance of these functions.

*Local Treatment.*—It is advisable to remove the putrid membranes from the nose and throat and also the catarrhal discharges. To do this mechanical treatment consisting of the cleansing of the nose with a salt solution of the strength of one dram of table salt to one pint of water is useful. A weak (½ per cent.) solution of permanganate of potash solution can also be used to cleanse the nose by the aid of a syringe.

Septic products in the nose and throat will frequently lead to a fatal termination. Their presence is a constant menace to the blood by inviting toxemia. In addition thereto they give rise to fever and not infrequently septic material will find its way from the nose and pharynx into the Eustachian tubes causing abscesses. If neglected it may lead to mastoid involvement and brain abscesses or to septic meningitis, with *little or no chance of recovery.*

By studying the usually enlarged lymph glands, it is surprising to see what good result is apparent after cleansing the nose and pharynx.

*Local Treatment of the Pseudo-Membranes.*—The solvent effect of local remedies I have never been able to see. When papayotin has been used, I have been disappointed in its effect. Creosote vapors, by adding a dram of beechwood creosote to a pint of water and allowing the air to become impregnated with the vapor has shown some good in a few instances. Lugol's solution of iodine (half strength) applied by means of absorbent cotton, can be recommended. A steam atomizer containing a weak solution of (two per cent.) sulphurous acid is recommended by Dr. Nicholas at the Riverside Hospital. The latter has been used by me and certainly can be recommended when there are extensive necrotic patches. It is far better than the peroxide of hydrogen. Other local treatment which I have used with benefit is the inunction of unguentum Credé into the cervical glands. Rub in at least fifteen to twenty minutes two or three times a day. An ice-bag worn continually can also be recommended when there is an extensive edema.

*Hygienic Treatment.*—One of the most important adjuncts to the treatment consists in admitting fresh air. A patient with diphtheria should have all visitors excluded from the room. A good current of air should be admitted night and day, and thus oxygen so necessary in this disease is secured.

Oxygen is indicated and required when there is the slightest evidence of cyanosis. It will also relieve dyspnea when present. It is especially indicated during bronchopenumonia which so frequently complicates diphtheria.

*Fever Treatment.*—It is a wise plan to exclude antipyretic drugs during the treatment of fever in diphtheria. The best antipyretic measures consist in sponging with evaporating lotions such as alcohol and water or acetic ether, locally. Cold packs and flushing the bowel with cold water are very serviceable in some cases. When high fever, due to pneumonia, to nephritis or to any other complication exists, the same should be treated as though the disease existed independent of the diphtheria.

When fever exists and the child cries continuously then the ears should be examined. Frequently an otitis media will keep up high fever until the drum is ruptured. Ten to 20 drop doses of sweet spirits of niter are valuable if given several times a day. During the febrile stage of diphtheria calomel in $^1/_{10}$ to ½ grain doses, repeated several times a day is a useful adjuvant in fever treatment.

*Stimulation.*—Owing to the depressing effect of the diphtheritic poisons, stimulation should begin early. Strychnine $^1/_{100}$ gr. for a child one year old, repeated three or four times a day. The dose can be gradually and cautiously increased until a systemic effect is noticeable. Children will tolerate very large doses of strychnine just as they will tolerate very large doses of whisky. They can be combined. Tokay wine, champagne and coffee are valuable cardiac stimulants. Caffeine citrate and sparteine are also serviceable for enfeebled heart's action. The prognosis of a case of diphtheria is certainly better in a case where the heart has been supported until the toxemia has passed away.

65 East Ninetieth Street.

## A REPORT OF A CASE OF SPINA BIFIDA; OPERATION; DEATH.

BY CHARLES GREENE CUMSTON, M.D.,
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A. G., aged eleven months, was seen for the first time in the middle part of August, 1902. The family history was as follows: the father had contracted syphilis six years previous to his marriage but the mother, as far as one could ascertain, had never presented any signs of spe-

cific infection. The first child was born at seven months, conception having taken place a few months after marriage. Her second child was born at full term two years after the first one and presented a hare-lip, for which I had operated when the child was three months old; in other respects the child was apparently normal and fairly well-developed.

The third child was our patient. He was born at term and the labor had been an easy one but immediately after birth a reddish swelling was discovered on its back, the mother saying that at birth it might have been the size of a tangerine orange. This tumor slowly increased in size and latterly the mother thought that it had become tender on pressure as the child cried when laid on its back or during the toilet when the tumor was brought in contact with the towel.

Examination showed an apparently strong male baby while at about the level of the fourth and fifth thoracic vertebræ directly over the spinal column was a globular tumor the size of an apple presenting a rather broad base. It was covered by normal skin from its base to about the middle of its circumference while the remainder of the growth presented a reddish-blue covering. By manual pressure on the tumor, it could be reduced to a slight degree and it was noted that when this was done the large fontanelle was made to bulge somewhat and the child became uneasy as if from pain. Crying seemed to cause the tumor to become more tense and larger.

The large fontanelle was rather tense and had not become closed as much as usual considering the age of the child. Examination of the spinal column, thorax and ribs showed that there was nothing abnormal on either side. The movements of the lower limbs seemed perfect. By a carefully conducted palpation, we were not able to discover any cleft in the vertebræ. The tumor gave rise to fluctuation which was very distinct and a diagnosis of spina bifida was made and on account of the general good condition of the boy, and from the fact that the tumor was increasing in size an operation was advised.

After carefully preparing the region for several days, ether was given and an incision was carried near the base of the tumor so as to form two oval flaps. The skin was then separated from the cystic wall by blunt dissection with the finger down to the base of the tumor. After the cyst wall had been thoroughly freed, it was incised on one side and the cavity was explored with the finger. At the time of opening the cyst a considerable amount of colorless fluid escaped and after it had become emptied the bulging fontanelle was found to be quite depressed.

Digital examination of the interior of the cyst showed that it extended into the vertebral canal by a thin pedicle which passed through a cleft of the spinous process. The cleft measured about one centimeter in breadth. While exploring the interior of the sac a solid, whitish cord about the diameter of a lead pencil was found and recognized as the cord. This was inserted into the vertebral canal and a purse-string suture was placed at the base of the sac and after tying the cyst was removed by scissors. On account of the narrowness of the vertebral cleft an osteoplastic operation to cover up the gap was deemed unnecessary so that the skin flaps were simply united by aluminum and bronze wire sutures. The child stood the operation remarkably well, although when he left the table his respiration was rather rapid and the pulse beat was 145. He rallied rapidly, however, after a subcutaneous saline solution had been injected. Twelve hours after the operation, the temperature was 38.5° C. and the child was resting quietly with a pulse of 110.

The boy continued to do well for the first five days, his temperature being nearly normal in the morning with a slight evening rise while the pulse rate averaged about 100. He took his bottle well but on the beginning of the fifth day he appeared somewhat drowsy and in the evening the temperature had reached 39° C. For the next five days the drowsiness continued, the fontanelle was bulging and very tense, the child refused his bottle and he finally expired ten days after the operation.

Post-mortem examination revealed the following: After the skull had been opened a large amount of fluid escaped which was estimated at about 150 c.c. There was some blood in the longitudinal sinus. The pia was greatly injected. Both ventricals were greatly dilated and were filled with a turbid, blood-stained serous fluid. The third ventricle was also dilated while the ependyma was very hyperemic. The gray cerebral matter was very thin and in some spots it was not markedly distinct from the white matter. The medulla oblongata and pons were markedly hyperemic. Thoracic viscera normal. Spleen enlarged and soft. Perfect union of the operative wound had taken place and no cerebrospinal fluid had escaped.

A cleft occupying the fourth and fifth thoracic vertebræ was found seated in their spinous processes and protruding from this cleft was seen the cord covered by its normal envelopes. The cleft measured just one centimeter in width. The anatomical diagnosis was spina bifida, external and internal hydrocephalus.

Of the diagnosis of spina bifida there naturally can be no doubt. The tumor had existed since birth and had increased steadily in size. It was situated in the median line and when pressed upon diminished in size, caused the large fontanelle to bulge and the child became decidedly uneasy. The question is, In what subdivision of spina bifida should this case be placed? It is quite evident that a myelomeningocele could be excluded from the start on account of the absence of paralysis of the lower limbs and more especially from the fact that the characteristic anatomical conditions of this type of the congenital defect were wanting, namely, the differentiation of the medullovascular, epitheloserous and epithelodermic zones.

Both the composite forms, namely, myelomen-

ingocele antero-posterior and ventralis could also with a fair amount of certainty be excluded because the cleft in the vertebræ is usually so wide that it can be easily detected by palpation while in the case under consideration the opening in the bone could not be made out. By exclusion we therefore only have remaining meningocele, simple myelocystocele, and myelocystomeningocele dorsalis.

An uncomplicated meningocele, as is well known, is an extremely rare type of spina bifida and in most instances in which it has been observed, it has been met with in the sacral region. My diagnosis made before the operation was that of a myelocystocele because the tumor presented a broad base and also from the fact that pressure over the cyst produced a marked bulging of the fontanelle.

As far as the indications of the operation were concerned, the necessity of an absolutely correct diagnosis was unimportant because no matter which of the two types of spina bifida was present the removal of the sac is at the present time generally considered as the proper treatment. On the other hand the cleft in the vertebræ was narrow and besides paralysis and other congenital defects were absent so that there were no contra-indications.

Considering the case all together it appeared to me that an operation was clearly indicated from the fact that the tumor was and had been steadily increasing in size since birth, and sooner or later the sac would rupture. Then again, the child was to all intents and purposes strong and well nourished and the tumor was certainly causing him a good deal of discomfort.

The operation in itself was of the most ordinary kind and when the liquid contents of the sac escaped it was noted that the fontanelle became depressed, which was proof positive that a communication existed between the cyst and the subdural or subarachnoid spaces for which reasons we concluded at the time of the operation we were in reality dealing with a case of meningocele. But by palpation of the interior of the sac our first supposition was rapidly done away with because a pedicle extending into the spinal cord could be felt and which by inspection proved to be the cord itself and could be explained as a sacculated condition of the coverings of the spinal cord. Our diagnosis was therefore changed to a myelocyst complicated by a dorsal myelocele.

In the case of a simple myelocystocele the substance of the spinal cord spread out over the wall of the sac is in most instances so reduced that its removal in no way interferes with the patient's health.

The cause of death after operation for the cure of spina bifida is usually meningitis, bronchitis, enteritis or loss of strength from the draining away of the cerebrospinal fluid. The loss of the latter is so detrimental that in a case reported by Marchand in the *Revue de Chirurgie*, in 1891, he lost a patient from this cause following simple puncture of the sac.

In our case, an internal and external hydrocephalus was demonstrated at the autopsy and should have been a contra-indication to operative interference, but the symptoms pointing to hydrocephalus were not clearly marked. The child's head was not unusually large at the time we saw him, nor could it have been excessively large at time of birth since it gave rise to no impediment during labor.

## MEDICAL PROGRESS.

### MEDICINE.

**Correlation of Alcoholism, Crime and Insanity.**—Careful investigations into the etiological factors which result in filling our jails and insane asylums shows that inebriety is undoubtedly the most important. C. A. Drew (Med. Rec., June 20, 1903) says that there were 154 cases committed to the Massachusetts State Asylum for Insane Criminals during the past two years and of these only 11, or 7 per cent., claimed never to have used alcohol as a beverage. Of these 11 cases, 3 were epileptics and 2 were well-marked cases of imbecility. Ninety-six per cent. of the cases considered themselves hard drinkers, the majority having been drunk many times. He has been led to the belief that the offspring of sound, temperate parents are less likely to suffer from alcoholic insanity, though heavy drinkers, than the second generation who may not drink half as much. Pronounced alcoholism in the parents always means examples of mental disease and weakmindedness in the children, provided the alcoholic tendency is not acquired somewhat late in life. An inebriate father is certainly a handicap, an inebriate mother is a greater misfortune, but the child of an inebriate father and mother is almost certainly doomed from its birth. It has often been proven by the most eminent modern investigations that even a moderate quantity of alcohol in the circulation will cause marked changes in the cortical neurons of the brain. Changes in the nucleus, granular bodies and protoplasm may be actually seen. Because these cells are the material basis of man's moral sense and conscience, the physical representatives of his aspirations, his likes, his fears and his will power, their harm seems to be of far greater importance than the question of the food value of alcohol or the effect of alcohol on the stomach and liver. It is a law of nature that the most highly organized tissues suffer first and most from toxic agents in the blood, so it is the moral and ethical sense which suffers first and most and is often the only manifest evidence, in the first generation, of the baneful effects of alcoholics taken in moderate quantities.

**Chyluria.**—An interesting case, in which this rare condition was present, is reported by Bécizneul (Gaz. Méd. de Nantes, May 30 and June 6, 1903). The patient, a youth of sixteen, in good health, sought advice on account of the appearance of the urine, which, in the morning, was of milky consistence and color while during the day its normal limpidity was maintained. Upon standing for several hours, the specimen did not clear; neither did filtration or centrifugation restore its normal color. Examined under the microscope, numerous fine granules were seen, the nature of which could not be determined; but upon addition to the specimen of a small amount of ether, a certain number of the granules coalesced to form globules, analogous to milk globules. The presence of albumin in large quantity was shown by the usual tests. A curious feature in the case was the fact that not only the night's repose was followed by elimination of chylous urine, but the horizontal position, maintained during the

day for but an hour and a half, sufficed to give the previously limpid urine the milky appearance seen in the morning. Out of a series of ten cases collected by the author from the literature of the subject, a like effect of the horizontal position upon the urine occurred in four. In Becizneul's case, repeated tests showed the limpid day's urine to be entirely normal; while the night's urine invariably contained the elements of chyle. A careful study of the blood and urine failed to show the presence of *Filaria sanguinis hominis*, the most frequent cause of chyluria; therefore the case is to be classed as chyluria nostras.

**Carcinoma and Diabetes.**—The relation of these conditions one to the other has heretofore met with little consideration until the recent observations of Boas were published. He came to the conclusion that in isolated cases the carcinoma seemed to exert an antagonistic influence on the primary diabetes, but as a rule no effect is seen. Another contribution has just been made by K. Oestreicher (Prag. med. Woch., June 11, 1903), of Carlsbad, who found four cases of carcinoma in 247 cases of diabetes under his care. His results agree with those of Boas. In one instance, the carcinoma appeared in the sixth year of the disease, and while in former years it had always been possible to reduce the sugar to a minimum amount by treatment, as soon as the carcinoma appeared the sugar could not be brought below two per cent. The same condition occurred in the following year. During the next year the tumor grew rapidly, and ulcerated. It was then found that the glycosuria became markedly reduced (0.5 per cent.); and the diabetic symptoms improved. In two other cases the diabetic symptoms became steadily worse with the appearance of the carcinoma. In the fourth case no connection could be traced between the two conditions. It is seen, therefore, that there is nothing characteristic in the course of a diabetes when a cancer intervenes, except that in one case an antagonistic influence seemed to have been exerted.

## SURGERY.

**Total Extirpation of Prostate.**—The various operations for the relief of the many distressing and even serious symptoms which arise from an enlargement of the prostate gland have received a great deal of attention of late, and are deserving of much more study on the part of the general practitioner. The total extirpation of the organ is considered by most people as an extremely difficult if not an impossible operation. P. J. Freyer (Practitioner, June, 1903) has been performing this operation several years and believes that the difficulties experienced by most men in their attempts at total enucleation result from their ignorance in regard to the anatomy of the organ. The prostate is in reality composed of twin organs, which remain separate in some of the lower animals, but in man they approach each other and become agglutinated except along the course of the urethra, which they envelop in their embrace. Each of these two bodies is enveloped by a thin, strong fibrous capsule which extends over the entire organ except along the upper and lower commissures, or bridges of tissue, that unite the lateral lobes above and below the urethra, thus filling in the gaps between them. This true capsule is intimately connected with the prostatic mass and cannot be separated from it except by dissection. The urethra, accompanied by its surrounding structures passes forward and upward between, and is embraced by the inner aspects of the two glands or lobes. The ejaculatory ducts do not pierce the capsule but enter the urethra through an interlobular fissure. The prostate thus enveloped in its true capsule is further encased in a second capsule or sheath, formed by the rectovesical fascia, numerous connecting bands, however, passing between the two. The prostatic plexus of veins and the larger arteries lie between the two capsules or in the outer one. In the operation described it is the true capsule which is removed, the sheath being left behind, thus preventing infiltration of urine into the cellular tissues of the pelvis. Another important anatomical fact not usually appreciated is the part of the gland usually enlarged and the direction it takes. The enlargement is principally adenomatous in character, and at first probably entirely extravesical. Its expansion, however, is limited by the pubic arch, triangular ligament and sacrum, so that it soon becomes necessary for its advance to be made in the direction of least resistance, namely, into the bladder. The sheath, which at the posterior aspect of the prostate is least defined, becomes gradually thinner as the enlargement advances until it is finally burst through, leaving nothing but the mucous membrane covering the prostatic gland. To accomplish the ideal operation, suprapubic cystotomy is performed after first thoroughly washing out the bladder, leaving the catheter in situ. One forefinger is then placed in the rectum and the other passed through the wound into the bladder. The mucous membrane over the most prominent portion of one lateral lobe, or over the so-called "middle lobe," is scored through by a sharpened finger-nail and gradually detached by it from the prostate projecting into the bladder. The true capsule of the prostate is here at once reached and by keeping the finger tip in close contact with the capsule, the enucleation of the prostate out of the enveloping sheath outside the bladder is proceeded with by insinuating the finger-tip in succession beneath, outside, and above one lateral lobe, thus separating the capsule from the sheath. The finger is then swept from without inward, above and to the inner side of the lobe, detaching this from the urethra, which is felt covering the catheter and pushed upward toward the symphysis, between the lateral lobes, which will, as a rule, have separated along their superior commissure in the course of the manipulations. The other lobe is similarly treated and when the apex has been freed, the whole gland is drawn and pushed into the bladder and then out through the abdominal wound. The ejaculatory ducts are usually torn across but that is of trifling importance. There is, as a rule, very little bleeding and this is controlled by irrigation with hot solution through the catheter. In several cases the urethra has been torn across completely and even portions of it removed. No subsequent ill effects have resulted from such unavoidable mishaps and such accidents are not to be greatly regretted. The remote results from such an operation are excellent and complete resumption of normal urination is almost always attained. Of 45 patients thus operated upon, ranging in age from fifty-seven to seventy-nine years, 40 have been successful both immediately and remotely.

**Sterilized Catgut.**—A rapid and easy method of sterilizing catgut is proposed by J. M. Garratt (Am. Med., June 27, 1903), and the gut has withstood the test in some 3,000 operations. The gut is cut into suitable lengths, 10 and 20 inches, and several of these strands are placed in envelopes of unglazed paper. The latter are sealed and marked with indelible ink or pencil with the size of the gut. These envelopes, to the number of 40 or 50, are placed in a quart-size preserve jar which has been freshly sterilized, and covered with a solution containing mercuric chloride gm. 1 (gr. 15); tartaric acid gm. 5.5 (gr. 75); Columbian spirits and ether, of each one pint. Depending on the size, the gut is left in the solution for from four to twelve hours. The jar is then drained, and filled up again with Columbian spirits and tightly closed. It is essential that the Columbian spirits be used. After the needle is threaded when the gut is to

be used, the latter should first be placed in freshly distilled water. The material has been proved to be tough, pliable, strong and thoroughly aseptic.

## OBSTETRICS AND GYNECOLOGY.

**The Indications for Hysterectomy in Puerperal Sepsis.**—A very able argument on the various means and methods to be pursued in this condition is set forth by Valére Cocq (Gaz. de Gyn., April 1 and 15, 1903), and the results of the discussion are told in the following summary: In general hysterectomy is indicated when there is a grave toxemia or when the uterus has in all probability become the chief entrance of the septic material; and in spite of all other means of treatment have been tried and the patient is still sufficiently strong to withstand the operation. These conditions are present in certain cases where the placenta has been retained and is undergoing decomposition and where it cannot be removed by the curette. Also in the case of a suppurative metritis where fibroids have undergone prolonged compression during the course of labor, degenerating, and clogging the flow of the lochia by their rough surfaces, destroying the endometrium, facilitating the reabsorption of the septic products through their great vascularity. In streptococcic septicemia the ablation of the uterus which, though macroscopically without lesion, but in reality thronged with the organisms, exercises a most happy influence on the final outlook in the patient's recovery. Cases where there is large involvement of the parametrium and the adnexa are only too often treated by ice and opium in the hope that operation may be avoided, but sooner or later the radical operation is found to be necessary to save the life of the patient.

**Conservative Surgery of the Appendages.**—Since the month of May, 1896, to the month of December of last year, Hector Treub (Am. Gyn., May, 1903) has operated upon, or treated in his clinic, 612 cases of salpingo-ovaritis. Out of these, 70 per cent. have been more or less completely cured, without operative intervention. The uniform treatment in all of these cases has been as follows: Complete rest in bed and the application of an icebag as long as there was any fever; the acute symptoms passed, warm vaginal injections (45° C.), vaginal tampon with glycerine and warm water compress (Priessnitz's bandage) on the lower part of the abdomen. The duration of treatment varied from a few weeks to several months; the average duration could be rated at about six weeks. In every case the woman considered herself cured, having no longer subjective symptoms of the disease. Out of the 70 per cent. there are about 20 who have been treated more than once in the same manner, which would equal about 5 per cent. of relapses more or less serious and in every case sufficiently troublesome to necessitate another sojourn at the clinic. In order to be certain not to exaggerate the results of non-operative treatment, it may be said that little over one-half the cases of salpingo-ovaritis necessitated no operative intervention whatsoever. The significance of this fact is clear, and it is important to emphasize it, since in these modern times, even, it is held a part of good surgery to remove the appendages when they are diseased. Massage is excessively dangerous in the cases of obstinate salpingo-ovaritis, where one is never sure of not finding a purulent focus of inflammatory intraperitoneal mass. Although the final results will not be uniform in all the cases treated by non-operative intervention, one finds that conservative treatment offers: (*a*) A danger of death which ought to be estimated two per cent. at the most; (*b*) some chances more or less great of not giving complete relief to the patient; (*c*) some chances also of being insufficient and necessitating a second operation either conservative or radical; (*d*) the certainty of not procuring for the patient a new malady, under the form of the anticipated menopause. Again: medical treatment suffices in at least one-half of the cases of salpingo-ovaritis. It being insufficient or contraindicated, one should never at the outset perform a radical operation of any sort. The first operative stage should always be posterior colpotomy. When by means of this proceeding it is discovered to be a tuberculous process, hysterectomy should be performed as soon as possible. In cases of hydrosalpinx which do not yield to repeated colpotomy, and which necessitate other intervention, and in cases in which one wishes to remedy sterility in women, the conservative operations (resection, salpingotomy, salpingo-ovarosyndesis) are indicated. Salpingorrhaphy should be reserved as an accessory operation to a course of laparotomy performed for no matter what other indication.

**Weight Wave of Menstruation.**—The record of the daily weight of four healthy, unmarried women between the ages of twenty-two and twenty-nine, and of average menstrual regularity, during a total of 23 menstrual periods, discloses a phenomenon which W. T. Belfield (Jour. Am. Med. Ass'n, June 13, 1903) terms the weight wave of menstruation. During several days, especially the first, preceding the flow, there occurs a progressive increase in weight, from 2.5 to 5 pounds, which may be from 1.5 to 5 per cent. of her usual weight. The climax of this gain is followed by a rapid loss of about half within eight to sixteen hours, and then a more gradual loss of the remainder, extending over several days. The flow begins during the loss, often following immediately on the crest of the wave, and terminates about when the weight returns to its normal lever. The premenstrual gain is due to diminished excretion, especially of water, and the rapid loss to rapid excretion, notably of carbon dioxide and water. After the weight has sunk to its premenstrual level, there may be another crescendo and diminuendo movement, lasting several days, but less pronounced. Hereafter the weight shows no constant variation until there occurs a sudden transient loss which is the forerunner of the next period. Two cases of irregular menstrual habit, exhibited the wave on several occasions when the flow was nearly or quite lacking. A woman of fifty-nine years, who had not menstruated for twelve years, showed no characteristic wave. For two days preceding the climax in weight there is often marked torpidity of the bowels and scantiness of urine; while, with the decline in weight, excretion in all channels is notably increased. The temperature curve is not constant; there is usually a rise of about 1° F. during the increase in weight and a sudden fall after the crest of the wave is passed.

**Immediate Delivery in Eclampsia.**—Statistics have shown that 75 per cent. of the deaths which take place as a result of childbirth are caused by infection and puerperal fever. The remainder are mainly due to hemorrhage and eclampsia. The treatment of the latter cases has left much to be desired until very recently. E. Bumm (Münch. med. Woch., May 26, 1903) gives the result of his extensive experience, having personally treated 112 cases during twenty years, by all the methods in vogue at different times. His observations during the past two years have convinced him that in every case where the eclampsia is seen soon after the first attack, while the pulse is good and the lungs are still intact, a favorable issue always results from the immediate emptying of the uterus. The mortality according to his belief, will be reduced to not over five per cent. by this procedure. If the cervix is completely dilated, version, forceps or, if necessary, perforation is indicated. If the cervix is partially opened, further dilatation may be best accomplished by combined version, pulling down a foot and using the breach to complete

the dilatation, and the author believes it can be done just as quickly and possibly with less danger for the unpractised, than with the metal dilators. For a closed cervix and delivery indicated at once, the vaginal Cæsarian section as devised by Duhrssen, is the method to be preferred.

**Conservative Operations in Sclerocystic Ovaritis.**—A plea for the conservative treatment of sclerocystic ovaritis is made by A. Boursier (Jour. de Méd. de Bordeaux, May 24, 1903), who holds that the choice between the radical and conservative operations should depend upon the condition of the tubes. In his belief, castration should be resorted to only when the tube is seriously involved, as well as the ovary. When, however, the tube is healthy or shows but a slight thickening of its walls, or a congested condition, with permeable lumen and orifices is present, he gives the preference to partial resection of the ovary or ignipuncture of the cystic follicles. It is the author's practice, in the case of a large cyst, to resect as completely as possible the diseased tissue, and suture the wound with catgut. When, however, numerous small cysts are present, he has obtained his best results from multiple ignipuncture; care being exercised to allow no smallest cyst to escape cauterization, lest it should increase in size and give rise to a return of the distressing symptoms. The immediate relief obtained by such conservative operations has been, in Boursier's experience, invariable; though in a certain number of cases, there was a temporary return of pain as the menstrual period was approaching and in nervous subjects, a continuance of pain was not uncommon. A complete cure is recorded in 30 per cent. of the author's cases and pregnancy occurred in 2 out of the 23 who were kept under observation.

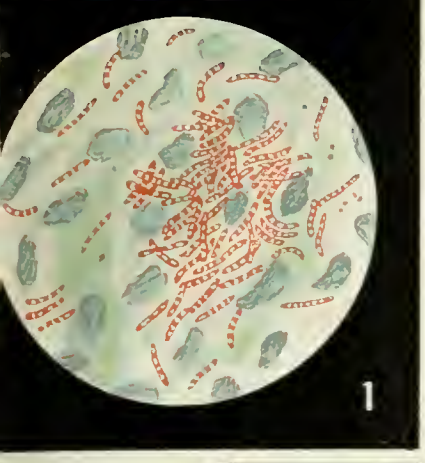
**Uterine Myomata and Sterility.**—The statistical evidence presented by numerous authors is so contradictory that no definite conclusions can be drawn as to the direct influence of uterine myomata on sterility. Some further figures are presented by L. Austerlitz (Prag. med. Woch., June 11, 1903), who brings forward the clinical material of the gynecological clinic at Prague seen during a period of nine years and including 5,217 cases. Of these 339 or 6.5 per cent. were afflicted with uterine myomata, and among 302 of the latter class, who were married, 80 never carried a child to term and 67 never conceived. The remainder were fertile. Considering a primary sterility as a condition in which conception had not occurred during the first five years of married life, or where five years had elapsed after child-bearing without any conception following, it was found that this occurred in 151 cases, or 4.17 per cent., which presented no evidences of myomatous disease, and in 61 cases, or 20.23 per cent., afflicted with myomata. Secondary sterility in the former class was found in 13.68 per cent., and in the latter in 21.85 per cent. This evidence shows that there must be some relation existing between myomata and sterility. Fertility seemed least affected by the submucous myoma, especially of the pedunculated variety, and successively more by the subserous, interstitial and the mixed forms. Among the unmarried cases conception also seems to have been markedly influenced by the presence of myomata, for in the latter case it occurred in 18 per cent., while among the non-afflicted unmarried women, conception took place in 56 per cent.

## HISTOLOGY, PATHOLOGY AND BACTERIOLOGY.

**Agglutination of the Bacillus Subtilis.**—The number of spore-bearing micro-organisms for which agglutination has been determined is comparatively small. S. S Kneas and J. Sailer (Univ. Penn. Med. Bull., June, 1903) have found that the *Bacillus subtilis* gives a typical reaction of agglutination with the blood serum of rabbits into which it has been injected, in dilutions as high as $^1/_{2500}$. Owing to its size and motility, it is an excellent subject for the demonstration of this reaction. Although it has generally been considered one of the most perfect types of a non-pathogenic micro-organism, later investigations have shown that under certain circumstances it may become pathogenic, causing death in the lower animals and a destructive inflammation in human beings. A number of such cases have been reported but nothing definite has been formulated.

**Chemical Pathology of Acromegaly.**—The chemical abnormalities that occur in this disease have been but little studied. Some recent studies on this subject have been made by D. L. Edsall and C. W. Miller (Univ. Penn. Med. Bull., June, 1903) on one case which exhibited striking progress and presented no signs of diabetes, and were controlled by another in which the disease was at a standstill. Careful measurements were taken and the food, consisting of milk, meat, rice, bread and butter, analyzed for the quantity of $P_2O_5$, CaO, and N. Analyses of urine and feces were then made. The figures in general demonstrate a striking retention of phosphorus and nitrogen, and a less marked retention of calcium, a condition of affairs that is somewhat remarkable when we consider that in this disease the skeleton shows such notable changes. The excessive nitrogen retention gave expression in the abnormal growth of the soft tissues, a common feature of this disease. The very large retention of phosphorus can only be explained by considering that it is used in constructing tissue that is especially rich in phosphorus, as the calcium retention was relatively small. As these cases are usually imbecile, it may be assumed that the overgrowth is in the nervous tissues. Under normal circumstances the amount of calcium in the daily feces is eight or ten times the amount in the daily urine. In this case, however, the amount in the urine nearly equaled that in the feces. This is a condition frequently met with in diabetes mellitus, when acid intoxication is present, and has also been produced by a strict proteid and fat diet. No definite conclusions could be reached from the experiments made to explain this fact, but it seems that there is some abnormality of metabolism that causes a solution of calcium from the bones at the same time that there is in other parts of the bone an abnormal deposition of bone salts. This does not appear to be the result of general acid intoxication, but is probably due to the formation of some acid that combines with calcium with especial readiness. Some of the calcium is apparently carried off in solution, another part may be simply redeposited and leads to the abnormal growth of bone. Of this, however, we have no definite knowledge. These observations seem to emphasize the view that there is in acromegaly a growth of abnormal bone rather than a mere abnormal growth of bone, and that there are every marked abnormalities in the soft tissues, as well as in the bones. Further studies may demonstrate that the alterations in the bones are the result of metabolic abnormalities rather than of a mere tendency to distorted overgrowth.

**Proteinochrom, a New Color Reaction.**—Some years ago a substance of undetermined chemical composition was discovered as one of the end products of albuminoid disintegration, which reacted with chlorine or bromine to form a violet-red pigment body—proteinochrom. It was found to occur as a result of fermentation in pancreatic digestion, and as the result of bacterial action in the decay of albuminoid substances. Some further clinical and bacteriological investigations have lately been conducted by P. Erdmann and H. Winternitz (Münch. med. Woch., June 9, 1903). Attempts to demonstrate the presence of proteinochrom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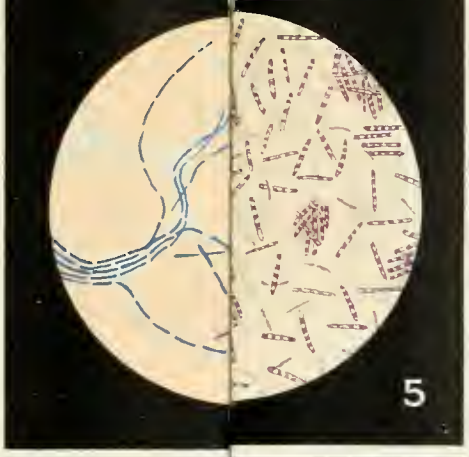
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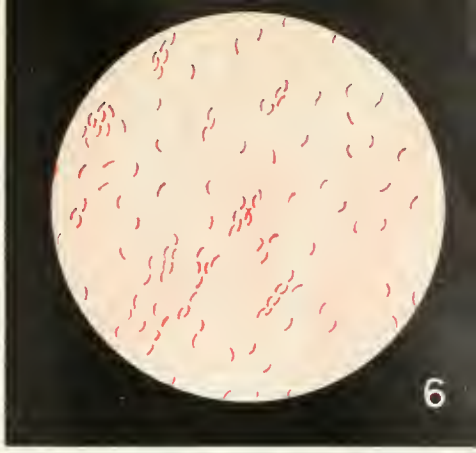
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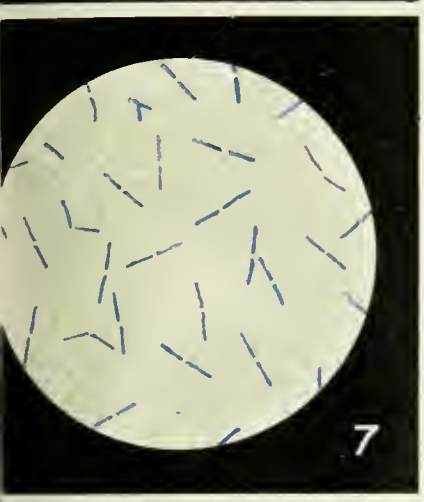
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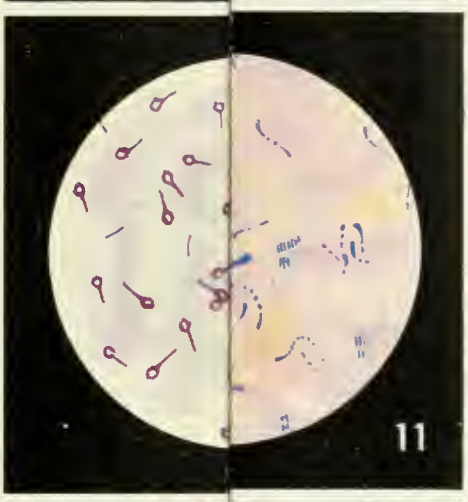
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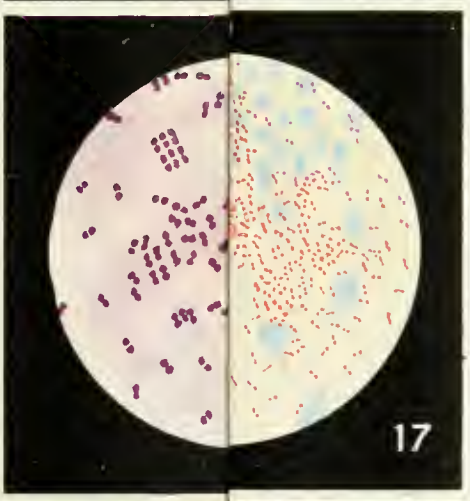
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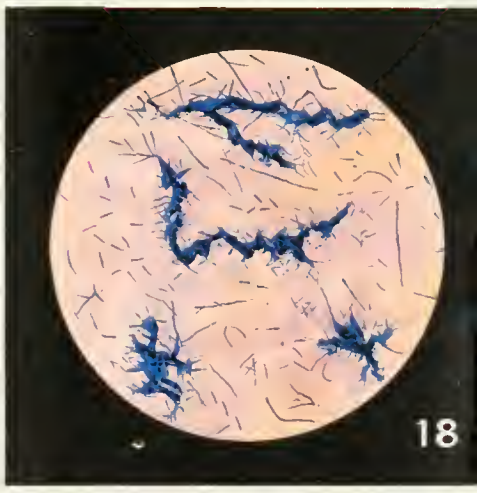
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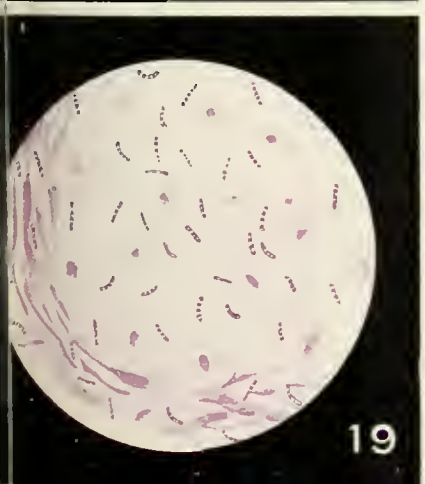
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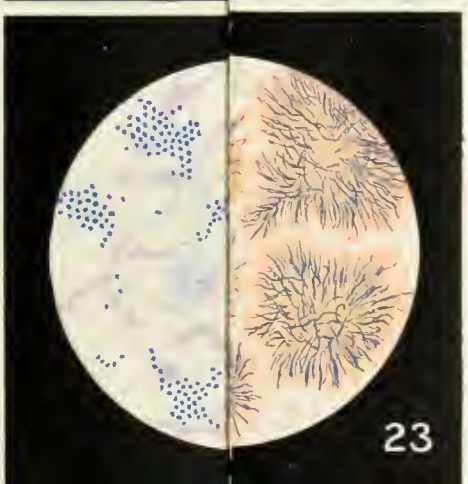
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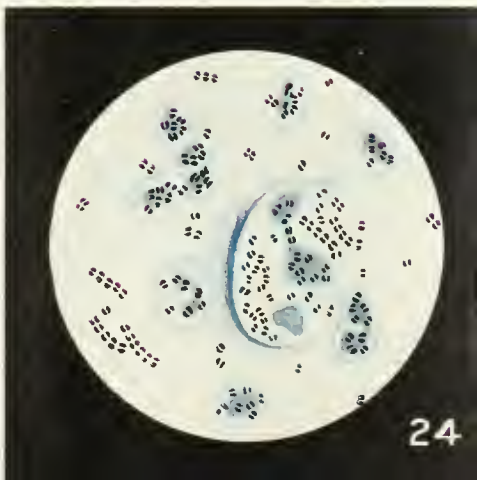
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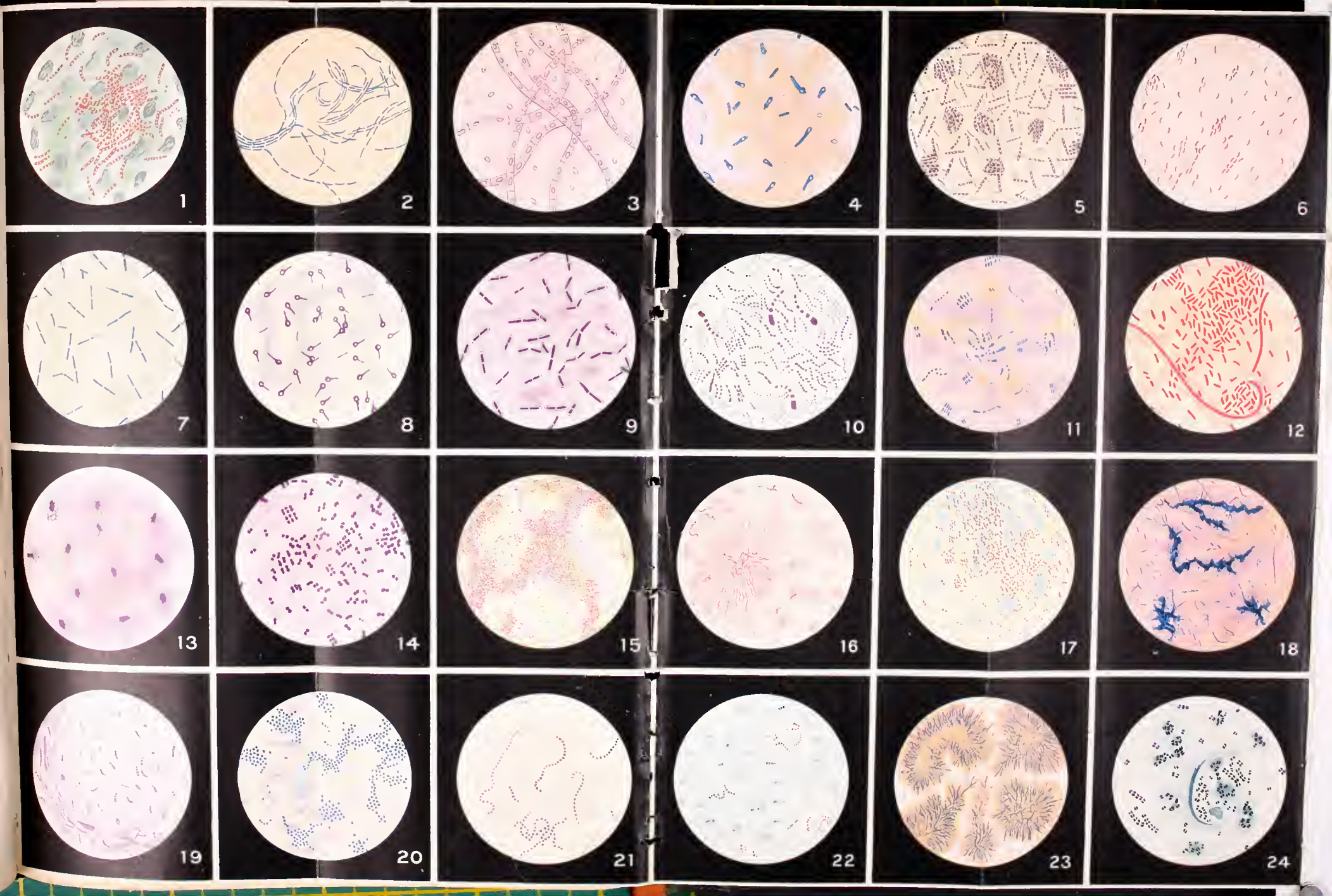
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during gastric digestion after test meals in perfectly normal individuals, were unsuccessful, as were also those in pathological cases of a non-malignant type, such as chronic gastritis, anacidity, sub- and hyperacidity. In cases of malignant disease, the reaction could only be demonstrated when there was present a retention of the gastric contents, due to stenosis. When the stomach was washed out before the test meal was given, no reaction was found. As a differential diagnostic sign, the test is therefore only of value in advanced cases. The reaction was also demonstrated in the diarrheal stools accompanying tuberculosis, chronic catarrhal enteritis and typhoid. In normal feces the reaction was not found. As the proteinochrom was believed to be a product of bacterial metabolism, particular attention was given to its appearance during the growth of various bacteria on suitable media. It may be compared with indol, which is a product of the same sort, although of somewhat different origin. The tests were made on solutions and bouillons made with peptone. Large numbers of bacterial species were studied, and it was found that proteinochrom was formed by the majority, although the appearance of the reaction varied from one to ten days. If the appearance was delayed longer than ten days, the test was considered negative. Comparing the results with the tests for indol, it was seen that certain bacteria formed indol but no proteinochrom, whereas others formed both, but with a marked difference in time of appearance. The diagnostic value of the reaction depends on the information which it affords regarding the biochemic activity of the bacteria, in other words, to what stage the bacterial disintegration of the albuminoids has proceeded, the appearance of the proteinochrom reaction indicating that it has advanced to the formation of leucin and tyrosin. In differentiating a typhoid from a *Bacillus coli* infection, it was satisfactorily demonstrated that cultures of the latter showed no proteinochrom reaction, while the presence of indol could be demonstrated on the second day. In contradistinction to this, the cultures of typhoid bacilli showed the proteinochrom reaction from the second day on, whereas the indol had not appeared by the fourteenth day. This seems to point favorably to a new color reaction for the typhoid bacillus, which may aid in differentiating it from the *Bacillus coli communis* in doubtful cases.

## GENITO-URINARY AND SKIN DISEASES.

**Myositis Syphilitica.**—In a study on Myositis Syphilitica, J. A. FORDYCE (Jour. of Cut. Dis., April, 1903) says that the involvement of the muscular system by syphilis is of relatively rare occurrence. Matzenaur, in Neumann's clinic, has observed, in the early period of the disease, one or two cases among seven thousand patients with syphilis. The early so-called myalgias may be due to hyperemia with slight exudation in the connective tissue of these organs or to irritation of the peripheral nerve by the disseminated poison of the disease. They have, as a rule, little clinical significance, as they usually rapidly disappear. The majority of textbooks on syphilis speak only of the diffuse interstitial myositis of the early period and the circumscribed gummatous tumors of the late stage. It is not always possible, however, to assign the cases seen in clinics to these two groups. In malignant precocious syphilis, gummata, usually in several muscles, have been observed in the early period of the disease. Matzenaur has seen multiple diffuse myositis and gummata in the same patient and the same conditions in the late stages of the affection. He has also called attention to the occurrence of muscle abscess following a diffuse myositis four and seven months after infection. A single muscle gumma in late syphilis can readily be mistaken for a sarcoma or other muscle tumors or infiltrations. Hartley has recently emphasized the importance of syphilis from the surgeon's standpoint, and has called attention to numerous errors in diagnosis in these and other specific conditions. The possibilities of syphilis are perhaps not so keenly appreciated by the general surgeon as by the syphiligrapher, and for this reason the observations of the one should supplement those of the other. Another type of myositis, presumably syphilitic, has been described by Herrick, in which a syphilitic patient suddenly developed painful swellings in the supinator longus and in the calf muscles. Examination of pieces of the involved tissue showed a diffuse inflammation with hemorrhages. He failed to find either vegetable or animal parasites, and attributed the condition to a specific infection ten years before the present trouble began. The author's critical comparison of his own case with the disease known as polymyositis acuta leaves doubt as to its true nature. The disappearance of the muscle swelling under such doubtful antisyphilitic treatment as iodine and iodide of potassium ointment scarcely lend weight to such a diagnosis. The histological investigations of Matzenaur show that the initial changes in the interstitial myositis and the gummatous variety are the same. In early syphilis the inflammatory process tending rather to diffuse changes, while in late syphilis more sharply circumscribed infiltrations result. The blood-vessels of the interfibrillary connective tissue are first implicated; the muscle-substance being secondarily involved. The preservation of the functional integrity of the muscle can only be secured by early recognition of the nature of the disease and a prompt recourse to specific remedies. The results of the affection are seen in the sclerotic changes which take place in the tongue as a result of chronic interstitial myositis in this organ.

**Massage of the Prostate and Albuminuria.**—The universal employment of massage in the treatment of gonorrheal prostatitis lends interest to the following observations of C. KRUGER (Münch. med. Woch., June 9, 1903). Two patients of nervous disposition, but otherwise normal, presented a chronic prostatitis of a gonorrheal origin, for which massage was instituted. During a period of five weeks albumin was constantly present in the urine while the massage was continued. A nephritis could not be demonstrated and sources of albumin from the contents of the bladder could also be excluded. In one patient a transitory albuminuria appeared on severe exertion at other times, but was not evident during the period of treatment. Tests were also made after various exercises in both patients, but resulted negatively. The author advises careful watching of the urine for the appearance of albumin in these cases and if combined with the presence of renal epithelium and casts, the massage should be stopped, and guardedly continued in the other cases. The author advances several hypotheses for the appearance of this condition, the principal idea being that the diseased prostate secretes substances, which have an irritating effect on the kidneys during the process of excretion, after they have been forced into the circulation by the massage.

**Diagnosis of Leprosy.**—An interesting account of the routine method of examining cases of leprosy in Hawaii is given by J. T. MCDONALD (Jour. Am. Med. Ass'n, June 6, 1903), who also draws particular attention to the general prevalence of the disease and the liability of its being undiscovered. He details the observations made on 150 cases. As a means of diagnosis the microscope stands in first importance, a minute strip of tissue being teased out and stained with Ziehl's carbol fuchsin in the same manner as for tuberculous sputum. Of clinical symptoms, maculæ, chiefly leucodermic spots are found in 89 per cent. of all cases. The lepra nodule

found in 74 per cent. is the chief distinguishing lesion of skin leprosy. Thinning or complete loss of eyebrows and eyelashes is present in 63 per cent. Atrophic changes in hands and forearms with retraction and contraction of fingers and enlarged ulnar nerve in 32 per cent., is a leading feature of nerve leprosy. The plantar ulcer was found in 26 per cent., absorption of phalanges in 16 per cent., facial paralysis in 11 per cent. The entire body should be carefully tested for anesthetic areas.

**Treatment of Nevus by Hot Water.**—The coagulating power of heat has been turned to good account by its use in the treatment of nevoid growths. F. Griffith (N. Y. Med. Jour., May 2, 1903) reports a case of nevus of the scalp and nose in a child seven months old where this mode of treatment proved very efficacious. Injections were made by means of a sterile hypodermic syringe and needle with the sterile water at a temperature of from 180° to 200° F. One fluid dram was injected without the aid of anesthetics and reaction was manifested by distention of the mark till it became a tense, blanched, cystic tumor. Injections were continued every three or four days for a period of three weeks when shrinkage and a flattening of the mark at a level of the surrounding surface had taken place.

## EYE, EAR, NOSE AND THROAT.

**Treatment of Purulent Conjunctivitis.**—The first step in the treatment of every case of purulent conjunctivitis should be the microscopical examination of the pus to determine the variety of micro-organism present. If the examination cannot be made at once it is usually best not to delay treatment to await the results. E. S. Thomas (Med. Rec., May 30, 1903) doubts whether the mild cases of conjunctivitis are ever gonorrheal in origin, so virulent is the usual condition produced by this germ and it is a fact that in the mild cases the gonococcus is not found. When the case is seen early a two-per-cent. solution of silver nitrate should be at once thoroughly applied to the whole conjunctival sac and an applicator with cotton should be carried entirely through the cul-de-sac under the upper lid. This latter procedure cannot be employed in children, but a thorough cleansing can usually be done. If the case is seen later and is very severe, a daily application of a three- or four-per-cent. silver solution may be indicated. With these stronger solutions it is best to neutralize with salt solution and also lay a pledget of cotton soaked in salt solution upon the cornea while making the application. Daily applications of silver are to be supplemented by irrigations with boracic acid solution, frequent enough to keep all secretions washed out. Cold applications prevent too great a reaction to the silver. Protargol is sometimes indicated when silver proves too irritating, as evidenced by increased discharge of serum and a tendency to bleeding. Protargol should not be used in stronger solutions than six per cent. Argyrol, 25 per cent., is actively germicidal and non-irritating and is a very valuable application if the astringent action of silver is not required. Protargol and argyrol are especially applicable to the cornea, as no staining may be feared from their use.

**Blepharitis Marginalis.**—Intractable cases of this disease are frequently met with and the routine treatment of text-books is found very unsatisfactory. D. S. Reynolds (N. Y. Med. Jour., June 6, 1903) has departed somewhat from the customary use of ointments in some of these cases and has obtained excellent results. One of the commonest forms of blepharitis marginalis seen in persons of every rank and station in life and of all ages, is that in which there is slight thickening of the borders of the lids. The anterior margins are dry and red, and the lash on close inspection is observed to be thin, while the cuticle between the hairs is covered with minute scales of desquamating epidermis. Many of these cases disappear entirely under correction of errors of refraction, of intestinal constipation and various conditions of malnutrition. Oftentimes, however, a complete cure seems almost impossible and recurrences are frequent. There is a fungus undoubtedly present in the hair follicles of such cases, and it is believed that these may be best eradicated by the periodical application of pure carbolic acid. The acid is prepared by adding about ten minims of alcohol to a dram of crystallized carbolic acid and agitating sufficiently to dissolve the acid. The point of a needle is dipped into this fluid and while the lid is firmly held with one hand, the detachable scales between the hairs are scraped off and the application of the acid made as direct and complete as possible to all the hair follicles of the margin of the lid. By repeatedly dipping the needle into the acid and scraping the skin, taking care that none shall run over the free border, the application can be made so thorough as to whiten all that portion of the skin containing the lash. The smarting which results should last only a few minutes. About the fifth day a crust of epidermis may be removed and a yellow oxide of mercury ointment applied. The carbolic treatment should be repeated in about ten days and in about three months, in most cases, a luxurious growth of lash has come in and with it an entire disappearance of all signs of blepharitis. In the more advanced cases which present an excoriated, glazed, rounded appearance of the torsal margin with no sign of lash or even in those instances where the removal of an abundant accumulation of inspissated serum discloses an ulcerated condition of the lids the use of the phenol is very beneficial. In the latter condition the ulcer should be thoroughly cleansed and dried and then the phenol carefully applied to its base. Striking results are thus frequently obtained.

## THERAPEUTICS.

**Vassale's Paraganglina in Gastro-intestinal Atony.**—The effect of this remedy—an extract of the suprarenal capsule of the ox—upon gastro-intestinal atony has been studied, in a series of cases, by U. Baccarani and A. Plessi (Gazz. Osped., June 7, 1903). The known effect of the suprarenal's active principle (which has been shown to reside in the medulla) upon unstriped muscular fibers, inducing their more forceful contraction and maintaining their tone, has, in the author's cases of gastro-intestinal atony, exerted a uniformly favorable influence. In gastric atony, 40 to 60 drops, divided in 5 to 8 daily doses, gave speedy relief and in the majority of cases, the cure was permanent, after suspension of treatment. In a certain number of cases, the remedy, when given by mouth, failed to influence intestinal atony; though there was immediate response to its effect when injected into the rectum. From this the authors conclude that atony of the large intestine was responsible for constipation in the latter class of cases and that atony of the small intestine was indicated when a favorable effect followed its administration per os.

**Antnrasol, a New Tar Preparation.**—The objectionable features of the ordinary tar preparations have led to the attempt to produce a substance free from the pitch and coloring matters, and one which, being in a more fluid form, would be less liable to become thick and harden. A. Sack and H. Vieth (Münch. med. Woch., May 5, 1903) have succeeded in producing a purified tar, which is fluid, of a light yellow color, and of the consistency of olive oil, but possesses the characteristic odor of tar. On account of its thin consistency it can be readily applied with a brush. It penetrates the skin very readily and leaves no residue.

# THE MEDICAL NEWS.

*A WEEKLY JOURNAL*

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## RADIO-ACTIVITY AND ITS POSSIBILITIES IN THERAPEUTICS.

RENEWED attention has recently been called to the substances that produce special spontaneous radiations which affect photographic plates and various sense organs of the human body and are physically recognizable in a number of curious ways. Professor Marckwald, of Berlin, made a series of demonstrations at the sessions of the International Chemical Congress held in Berlin during June. The metal experimented with was polonium, which so far has been but very little known and whose full powers were only more or less suspected. There is no doubt now that this new metal has the power of communicating the radio-active energy which it possesses to a number of other substances and that in this respect it must be compared with, if indeed its qualities do not exceed, the similar properties of radium. Now that physical therapeutic measures, hydrotherapy, massage, and vibratory stimulation of various kinds are coming to have due recognition as important remedial agents there is hope that these new metals may also prove of special service in the treatment of affections likely to be influenced by nervous stimulation or trophic alterations of any kind.

It is now some years ago since Professor Javal, the distinguished French ophthalmologist announced to the French Ophthalmological Society, that the X-rays could be made to produce certain effects upon the optic nerve of patients whose ocular media were disturbed. A short time after he made the additional announcement that uranium and the Becquerel rays, and, especially, radium with its wonderfully active qualities, might be of service not only in diagnosis, but to a certain extent in supplying the stimulus of the optic nerve that is ordinarily produced by light. The usually accepted discoverer of radium, M. Curie (though it is now definitely announced that he owes his temptation to study these substances to the initiative of Madame Curie, who had already made definite progress and more than suspected the existence of radium before her husband entered the field), pointed out at the beginning of his investigations on radium that the metal had a very definite action on superficial cutaneous nerves. He found that if a small glass vial containing even a minute quantity of a more or less pure radium salt were carried in the pockets for some hours the skin beneath the pocket became reddened, later it lost its superficial covering with the production of an ulcer rather difficult to heal.

This effect would seem to be manifestly a result of interference with the trophic nerve fibers leading to the particular skin area. The effect is not produced immediately but, as in the case of the X-rays, may be delayed for many hours or even days. The ulcer produced shows practically no tendency to heal for a considerable period, so that evidently the vital resistance of the part somehow dependent on its connection with the central nervous system is very much lowered. In recent times M. Curie has expressed the opinion that if a considerable quantity of radium in its pure state could be obtained, say, for instance, a kilogram (2⅕ pounds) that he would not care to enter the room in which it was placed, since there would be danger of lasting injury to the optic nerve and to the skin surface all over the body.

It seems clear that agents as powerful as these substances seem to be may well prove to have an important place in modern therapeutics. It is only within this last year or two that it became clear that for some forms of malignant disease the X-rays produce wonderful and as yet inexplicable effects that resemble, more than any other method of treatment ever introduced, nature's curative process in certain very fortunate cases of malignant disease in which the growth disappears spon-

taneously. Just what the effect is due to cannot as yet be determined. It would seem, however, that the growth of a neoplasm, even of a malignant type, depends on the trophic influences transmitted to it from the central nervous system. While the overgrowth of certain cells is a true insurrection among the citizen cells of the republic of the body, these depend for their possibilities of overgrowth on the ordinary metabolic processes of the system which are so much under the domination of trophic nerve centers. If nerves can be interfered with then by means of the paralyzing action of forms of radiant energy such as are now familiar in the X-rays and the radiant metals, it is not impossible that a very perfect method of cure for malignant disease may be at hand.

Up to the present time the price of these metals makes medical experimentation practically impossible. Radium, by those familiar with the conditions, is said to be worth about $2,000,000 a pound. It is not improbable, however, that other sources of the metals will be found than the one collection of mineral material in which, so far, they have been demonstrated to exist. Pitchblende is common enough and while only the one variety of pitchblende that is found in the Joachimsthal in Austria has so far proved to contain the precious radiant metallic combinations, it is not unlikely that corresponding material may be found among the rich and varied mineral deposits in our own country. As the material from which they are obtained is originally a waste product the value of the metals may be very much reduced by such a discovery.

Methods of preparation, which at present are long and complicated, constitute the real expense and these have been very much simplified in the last year, according to an announcement from Madame Curie herself, and there seems no doubt that further simplifications with great reduction in the price of these substances will occur in the near future.

Meantime we shall wait with not entirely hopeless anxiety to hear the first results from the therapeutic use of these metals. Professor Marckwald's demonstrations at Berlin make it clear that polonium is capable of communicating its radiant energy to many other substances in a very marked way. It is this quality that most of all might be expected to be of use in therapeutics. In his demonstrations Professor Marckwald used only about one-sixth of a grain of polonium. This indicates the wonderful latent energy that is contained in the new metal and shows that the time will not have to be waited for when large quantities of it are at hand for experimental purposes before the metal can be used in practical medicine.

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### THE MOSQUITO'S DEATH KNELL.

The old saw that "Big fleas have little fleas to bite them; and little fleas have lesser fleas, and so *ad infinitum*," is applied very ingeniously by Dr. Charles Warner Stiles—whom we might designate as the great American germ discoverer—to the extermination of the mosquito. In addition to serving as intermediary host for the parasite of malaria, the mosquito, it seems, entertains a little on his own account. He has a plague of a guest, named *Agamomermis culicis*, a parasite that kills millions of mosquitoes each year. If it is a "bad year for mosquitoes," the assumption is that it is a good year for *Agamomermis culicis*. This parasite has its habitat in the abdomen of the mosquito. Infection takes place in the larval or pupal stages of the mosquito. The infected mosquitoes are sluggish and short-lived, and the females do not breed.

Now, if the parasite can be cultivated and let loose upon the unborn mosquito, the theory is that he will be exterminated, and the place thereof shall know him no more. The only difficulty is how to do it. Possibly one might do cultures of this fatal parasite up in portable form like a fire extinguisher, with a small family size for cottage use, and a larger size for hotels. There could even be a handkerchief culture, something like a nitrite of amyl drop, that could be crushed in a handkerchief, letting the germs loose while walking through the meadows to one's suburban home.

The only satisfaction, however, that one could have on such occasions would be the purely altruistic one of infecting the young of the mosquitoes that were biting at the time, so there should be fewer to bite one's neighbor when he walked that way. If people were only more apt to be altruistic when they were being bitten by mosquitoes this scheme of throwing their parasites at them might work very well, and whole communities could combine and subscribe for the cultures.

Dr. Stiles admits that there is a little practical difficulty in distributing the parasite; but the government, we are led to believe, thinks it is the greatest thing out. And so it undoubtedly will be when Dr. Stiles has discovered some rapid and inexpensive way of breeding *Agamomermis culicis* in all the marshes where mosquitoes live.

## HYGIENE IN THE PUBLIC SCHOOLS.

EACH year, just after the close of the schools, the Regents of the University of the State of New York invite all those formally connected with educational institutions of various kinds in New York State and all others who are interested in our educational system to a conference held at Albany and known as University Convocation.

We are very glad to find that one of the discussions at the convocation this year had for its subject the important question of the teaching of hygiene in our public schools.

There is no doubt in the minds of those who have looked into the matter with any care that the present system of teaching hygiene to our public school children is not only inadequate to the purpose of giving a reasonable idea of an important practical, applied science, but also some of the prominent features of the teaching of what is supposed to be hygiene are not in accord with the opinions of those who in medicine and physiology as well as bacteriology and sanitary science are most favorably situated to know what the trend of scientific thought is at the present moment.

The discussion at Albany on June 30 was opened this year by Dr. Helen Putnam, of Providence, R. I., who suggested the necessity in the high schools of large cities, at least, of a special department of hygiene, to be presided over by some one who has made special studies in this branch. Her paper worked out in detail the arrangement and management of this department. There is no doubt that the recent progress in the science of hygiene not only amply justifies this idea, but it seems evident that no other satisfactory method of teaching this important subject can well be devised.

After all the most fundamental element in the establishment of a special department of hygiene must be the assurance that this department shall keep thoroughly abreast of the times, and as hygiene is above all an advancing subject, only those who are well grounded in all its principles should be permitted to instruct in this important branch. The development of our public school teaching of hygiene must come, and it is along these lines of specialism so accordant with the specialistic tendencies of our time that reorganization should be directed.

As was brought out in the discussion of Dr. Putnam's paper, the importance and the interest of hygiene as a subject for study among school children can scarcely be exaggerated.

Sanitarians have been making history in recent years that is much more important for the happiness and the evolution of the race than anything that the military men have ever succeeded in doing. None of our military operations during the Spanish-American War compare at all in importance or even in the effect they will produce to what has been accomplished by the army medical department for the sanitation of the West Indies during our few years of occupation of Cuba. There has not been a single case of yellow fever in Havana for nearly two years, though that disease was endemic there for probably two hundred years and there has been no case of smallpox for over two years, although that disease constituted one of the most serious occasional factors in the death-rate in the Island. The study of the fevers and peculiar anemias of Porto Rico has given important hints for the elucidation of anemic conditions not necessarily connected with malaria in tropical countries all over the world. Surely American children should know something of what is thus being accomplished by their fellow countrymen. There will be no lack of interest in the matter if it is only properly presented.

Sanitation has accomplished great wonders in other parts of the world as well as in the tropics. There are many thousands of people saved from death every year as the result of the enforcement of sanitary regulations in large cities, who would have been brought to an untimely grave if the death-rate of even ten years ago continued to prevail during the last two or three years. The head of the Board of Health, of Chicago, announced, as the hot weather came on, that there would be many thousand fewer little graves in the cemeteries of Chicago this year than were necessary even five years ago, though the city has increased in population not a little during the last five years, because the factors on which infant mortality depend are better understood and better methods for its diminution are in vogue.

The progressive president of our greatest university in this country, who is accustomed to interest himself in all matters of significance for education announced some time ago that our public school system was not fulfilling its purpose, since our people, all over the country, were still as ready as ever to be fooled by the fake advertiser of every kind—the palmist, the get-rich-quick man, the patent medicine vender, and all the others of that ilk. Surely the reorganization of the teaching of hygiene on a proper scientific basis in our public schools would do something to get us rid of the present influence which the

quack medicine fakir continues to wield over so many of the supposedly intelligent population of this country.

At the present time public school text-books call attention to the evils of alcohol with unstinted zeal though no mention is made of the fact that practically all of the most advertised patent medicines, the best known and the most used, all the wonderful tonics are really nothing more than alcohol made properly bitter by the addition of certain pharmaceutical materials which serve to give them a definite medicinal taste.

In the improvement of public school systems now become the favorite study of our best educators surely this subject of the proper teaching of hygiene should receive its due share of attention. There are those closely in touch with the public school system who feel that there are many things now forced upon the occupation of children that are scarcely more than show subjects. The satire upon the high school graduate of a year or two ago by one of our best-known comic weeklies that he and she carried with them out of school the burden of many volumes of useless information is not without its share of truth. We are not of those who believe only in practical education, but surely the matter of individual and community health is one of those important practical subjects that every young person should be given the basic principles that underlie its preservation. We shall look for some true progress along this line, now that educators seem to have taken the matter up seriously.

## A NEW DEPARTURE.

In these days when a gullible public prescribes for itself from the patent medicines on the frieze of the trolley-cars, or takes the profitable substitution that the druggist passes over the counter, it is no wonder that physicians feel a bit out of sympathy with the venders of drugs, and make unfavorable comparisons between the commercialism of the men who supply medicines and the science of the medical profession that prescribes them.

But we should never forget that were it not for the great manufacturers and importers of drugs we might still cull our own herbs, and use our own mortars and pestles. As an indication of the aid that such houses may be to physicians, we call attention to the colored plates of pathogenic organisms that have been prepared for the profession by the house of M. J. Breitenbach Co., the importers of Gude's Pepto-Mangan. By their permission we have inserted a few of the set of sixty in our advertising pages.

No text-book and no one work on pathogenic bacteria contains such a number of excellent diagnostic illustrations, nor such beautiful examples of lithographic art as these.

Many physicians are too far from libraries and laboratories to be able to put into practice the training of their college days. They need just such a set of reference plates to be able to make microscopical examinations. The recognition of this need and the care that has been taken to fill it shows a spirit of enterprise in this firm that we wish might serve as an example to others. For, if, instead of advertising to the public the manufacturers of drugs would make such valuable contributions to science as lies in their power there might be more sympathy between them and physicians.

The full set of sixty cuts has been prepared to send to any physician who writes for them, from the firm of M. J. Breitenbach Co., New York.

## ECHOES AND NEWS.

### NEW YORK.

**A Hospital for Consumptive Poor.**—The project of a tuberculosis hospital, to be founded by the City of New York for the treatment of incipient cases, on high ground back of the Hudson in Orange or Rockland County, appears likely of realization. The plan and scope of the scheme have been discussed in administration circles for several months and they may be laid before the Board of Estimate and Apportionment or come before the Board of Aldermen during the present month.

Mayor Low has all the details of the needs and capacity of the proposed institution from Commissioner Lederle of the Health Department, Commissioner Homer Folks of the Charities Department, and many scientific men. It was stated semi-officially that the hospital—land and buildings—would cost from $350,000 to $500,000, and would be under the control of the Board of Trustees of Bellevue Hospital.

**Tuberculosis Fakirs.**—The following from the *Herald* is worthy of preservation in medical literature as illustrating the methods of many similar institutions:

When the prosecution is ready to act in suppressing the many so-called "Koch" cure establishments purporting to be affiliated with Professor Robert Koch, the distinguished German tuberculosis expert, but which he has expressly repudiated no less than thirty times in letters sent to representative men in America, a mass of testimony will be ready. In addition to the data already prepared for the counsel of the County Medical Society, which has been investigating these so-called "Koch" lung cure concerns for nearly two years, it was learned last week that a former nurse at the West Twenty-second street establishment, who has also had experience at several other branches, has volunteered to tell some astonishing particulars about the manner of conducting business in these "consumption parlors."

This woman is now employed at a hospital in this city. She first entered the employ of the so-called Koch Lung Cure Company in Philadelphia, where a sort of training school for nurses is maintained by the parent office. Then she went to the Rochester establishment. Here is what she said when asked about her experience there:

"I had charge of the business department there. I received the patients when they first came to the office; I placed the advertisements, prepared the tuberculin and was the general supervisor of the office. I kept the books and banked the money most of the time."

"What was the treatment that was adopted in that office during the time you were there in charge?" she was asked.

"We got the tuberculin from the Koch Lung Cure office, No. 150 Nassau street, in little bottles containing about an ounce. This was used with six ounces of albolene. The albolene was colored for the consumption cases and bronchitis and the tuberculin that was used for asthma was plain white. We used alkanet root for coloring."

"How many patients were cured at that place?"

"None."

"How many ever gave testimonials as to being benefited or cured?"

"I think we got three who said they had been benefited, but never any that were cured."

This nurse was then asked about a letter which she said she had written by the direction of Wallace Cleveland Clark, M.D., the head of this particular so-called Koch Lung Cure Company, running as follows:

"We are interested in your case and want you to get well. We are glad to say that, through the generosity of a wealthy lady, whom we have cured, certain money has been placed at our disposal to assist deserving cases to take our treatment. Call soon, as we are making this same offer to others, and it will be a case of first come first served. Respectfully, K. L. C."

"What does 'K. L. C.' stand for?"

"The Koch Lung Cure."

"Was that the way Dr. Clark directed you to write the letter?"

"Yes."

"Do you know whether or not a generous lady, or any lady, was cured by the Koch lung cure and had deposited a sum of money for the purpose of benefiting other sufferers, as stated in this letter?"

"I can say positively that I know no wealthy lady was cured in Rochester and that there was never a dollar deposited for any such charitable purpose."

"What would you say, basing your statement upon your experience with the company while you were in its service, and from your observation, is the main object of the company in its advertisements?"

"To get money, to get rich, and absolutely nothing else."

"From what you know of your own knowledge concerning the company's mode of treatment and sale of medicine and general advertisements, would you state whether or not there is any virtue in its treatment and if it does humanity good or relieves the sick and suffering from consumption?"

"I would not take it myself."

"What do you say generally, based upon your experience?"

"I do not believe that it is any good."

Besides the testimony of this nurse, who has been in consultation during the last few days with Mr. Champe S. Andrews, the counsel for the New York County Medical Society, the method of the spurious "Koch" companies in obtaining testimonials has been investigated.

Here are extracts from a letter sent to a woman in Washington, D. C., signed W. C. Clark, the president of the concern:

"DEAR MADAM: You are probably aware of the fact that your testimonial has been inserted in the papers, and we realize that you are put to considerable trouble in answering letters and inquiries that come to you about your cure.

Should any one desire to have you call and see them at their home and you can spare the time, we would be very much pleased to have you do it. Of course, a dollar would be a very small fee for such a visit and we would be very glad to pay it. * * *

Kindly instruct us to answer them (the letters) for you and we will simply state that your case was cured, as stated in the testimonial. I believe that is all that is necessary. Hoping that you will take this in the spirit in which it is sent and will allow us to at least give you the amount that you would otherwise earn for the same amount of time, given, I mean, twenty cents per letter and twenty cents for each inquiry, I remain, very sincerely yours, W. C. CLARK."

This adroit scheme to obtain many alleged testimonials is said to have had an odd sequel, which may be brought out in the crusade of the County Medical Society against these impersonators of the German tuberculosis investigator.

## PHILADELPHIA.

**Tetanus Follows Toy Pistol Wounds.**—Seven deaths from tetanus have occurred during the three days preceding the writing of this letter. Of these five occurred in children, the wound in each case being caused by toy pistol. As usual the manufacturers and retailers of the fire-arms are blamed by the coroner, and the matter is allowed to drop. Efforts are being made in some of the laboratories of the city to determine if tetanus bacilli are lodged in any part of the ammunition used or if they are introduced into the wound from other sources. The results thus far have been negative.

**Crusade Against Smallpox Begun.**—Vigorous efforts are being made to prevent the spread of smallpox which has been increasing during the past two weeks. House to house vaccination is being carried out in the Twenty-eighth Ward which contains the greatest number of cases. The streets in those localities are to be flushed each day by the firemen. The Board of Health has notified the proprietors of stores that their places of business will be closed for fumigation whenever a case of smallpox develops. As a result the proprietors of two large department stores have notified their employes that all who have not been vaccinated within five years must submit to vaccination or be dismissed. There recently died at the Municipal Hospital a druggist who had been vaccinated unsuccessfully twenty-four times.

## CHICAGO.

**Appointment of Dr. Wm. L. Ballenger.**—Dr. William L. Ballenger has been elected to the Chair of Otology, Rhinology and Laryngology, made vacant by the resignation of Dr. Moreau R. Brown.

**Appointment of Dr. Frank Allport.**—Dr. Frank Allport has been elected Clinical Professor of Ophthalmology in the Northwestern University Medical School.

**Incorporation of Englewood Hospital.**—A new corporation has been organized, known as the Englewood Hospital and Training School. This will succeed the Englewood Union Hospital, which will surrender its charter. The new institution is not for pecuniary

profit. The plan contemplates the purchase of land for $20,000, on which will be erected a hospital building to cost $80,000, and to accommodate 148 patients, and this building will be equipped at a cost of $20,000.

**Effect of Hot Weather.**—Owing to the sudden onset of hot weather during the week ended July 4, 563 deaths were recorded, an increase of 109 over the preceding week, or about 24 per cent.

**Issuance of Permits to Hospitals.**—The Corporation Counsel has advised Health Commissioner Reynolds to issue licenses to general hospitals, even though neighboring property owners should object, serve written notice on the Mayor and Commissioner, and threaten suit for damages.

**Commencement Exercises of Jenner Medical College.**—Jenner Medical College held its graduating exercises June 30. Dr. G. Frank Lydston delivered the doctorate address on "The Young Man's Way to Success."

**Graduation Exercises of Harvey Medical College.**—This college graduated a class of 20 on June 27. Dr. Frederick D. Marshall presided, and Carl Svante Nicanor Hallberg, Ph.G., on whom was conferred the honorary degree of Doctor of Medicine, delivered an address.

**Northwestern Alumni Week.**—The exercises of alumni week at Northwestern University Medical School were attended by about 200 former graduates of the institution. Special clinics were held. At the banquet, Dr. Archibald Church acted as toastmaster, President James of the University welcomed the guests, and Hon. A. N. Waterman, Rev. I. A. White and Frederick Greeley spoke.

**Death of Dr. De Laskie Miller.**—Dr. De Laskie Miller died July 9, in this city. He was one of the oldest of Chicago's physicians, and had been prominent in the profession for many years. Dr. Miller was eighty-six years old.

## CANADA.

**Providing for the Ontario Epileptic.**—Woodstock, Ont., has been selected as the site for the buildings which the Ontario Government will erect for the care of epileptics in this Province. Accommodation will be provided for 100 patients, in all the best and most modern style. The institution will be extended as necessity demands.

**The Universities in Toronto Federating.**—It almost seems to be an assured fact that the 200 odd students of Trinity Medical College will be associated with the 400 medical students of Toronto University in the new medical building which has just been completed by the latter. The two medical faculties have already arranged the terms of union, and it but remains for the corporation of Trinity University to agree to federation. The scheme for federation between the two Universities has been laid before the Government, and it has met with their approval. Amalgamation has been most talked of between these two medical colleges during the past six months, and there are many who hope for the cause of medical education in Ontario, that the medical schools will open as a united body at the beginning of the next session.

**The Practice of Christian Science Gets a Setback.**—In November, 1901, at Toronto, a citizen was convicted of manslaughter on the charge that he had failed to provide medical attendance for his son, a boy aged sixteen years, who died from diphtheria. After the conviction had been secured at the Assize Court the matter was taken to the Court of Appeal, where the judgment of the lower court was confirmed. According to this decision it was found that there was sufficient evidence to warrant the verdict. This court also thought that the learned judge properly charged the jury that the word "necessaries" as used in the criminal code, includes medicine and medical treatment.

**Maritime Medical Association.**—It is now twelve years since this Association was organized at St. John, N. B. It will hold its annual meeting this year on July 22 and 23, in that city. One of the distinguished visitors who will attend and contribute a paper will be Dr. Maurice H. Richardson, of Boston, U. S. A. A paper on gynecology will be read by Dr. E. W. Cushing, also of Boston. Dr. G. E. Armstrong, of Montreal; Dr. F. A. L. Lockhard, of Montreal, and Dr. G. J. Evans, of Montreal, will all three be present and contribute papers.

**Ontario Medical Council.**—The Ontario Medical Council has been meeting in Toronto during the past week. The following officers were elected for the ensuing year: President, Dr. J. A. Robertson, Stratford, Ont.; Vice-President, Hon. Dr. Sullivan, Kingston, Ont.; Registrar, Dr. R. A. Pyne, Toronto; Treasurer, Dr. H. W. Aikins, Toronto. A great deal of discussion took place upon the report of a special committee on legislation which suggested amendments to the Ontario Medical Act, which would be beneficial and timely both to the public and the profession at the present time. The Ontario Government will be memorialized to more clearly define what constitutes the practice of medicine. The object of this is to protect the public from the surfeit of quacks and healers which infest the Province at the present day.

**The Montreal Antituberculosis League.**—The investigation committee of the Montreal Antituberculosis League held a meeting one afternoon during the past week which was presided over by Dr. Roddick, M.P. Dr. Harding was appointed permanent secretary for the committee. A number of physicians representing the outdoor departments of the various city hospitals and dispensaries of Montreal were present and discussed with the Committee the cooperation of these institutions with the League. Each hospital representative addressed the meeting and reported that the institutions they represented would be willing and glad to cooperate with the League in reporting cases of consumption that came under their notice. Arrangements were completed, whereby each hospital would fully report the tuberculous cases coming under its care. This will greatly aid the League in its efforts to obtain information concerning these cases in the city and give them great opportunities in trying to stamp out the disease.

**Royal Jubilee Hospital, Victoria, B. C.**—The annual report for the year ending May 31, 1903, of the above hospital is as follows: The total number of in-patients treated this year was 784; the total number of out-patients 163; as against last year in-patients 782; out-patients 122. The total collective days' stay was 17,628, as against 17,531 for last year. The daily average number of patients in the hospital this year was 48.108, as against 47.27 last year. The cost of maintenance was $31,881.17, while the daily average cost per patient was $1.80. The Medical Superintendent urged increased accommodation for private patients.

**The Retirement of Dr. W. B. Geikie.**—Dr. W. B. Geikie, who for many years has been Dean at Trinity Medical College, Toronto, and Professor of Medicine in that institution, has resigned from both positions and will cease the active teaching of medicine. Dr. Geikie was well known as one of the most prominent teachers in medicine since 1856. He became dean of Trinity Medical College in 1878, a position which he has held for 25 years, and the great success which has attended that school of medicine was due in a great measure to his unceasing energy in its behalf. Dr.

Geikie has been succeeded as Dean by Dr. J. A. Temple, who is Professor of Gynecology in the same institution. Dr. Temple has also been appointed to represent the College on the Ontario Medical Council.

**A New Hospital for Vancouver, B. C.**—Vancouver will erect a fine new modern hospital to accommodate at the present time 100 patients and providing for the necessary executive offices. Toward this end the citizens have subscribed $30,000. The city has given $20,000, and the Government of British Columbia will contribute $20,000 in addition to these sums. Plans are under consideration for a building capable of being enlarged to provide for at least 300 patients, with all the appurtenances of a modern hospital.

## GENERAL.

**Appointment of Dr. Müller.**—Dr. Frederick Müller of Chicago, at one time assistant to Dr. Adolf Lorenz, of Vienna, has been elected Professor of Orthopedic Surgery at the Milwaukee Medical College.

**New Honors for Dr. Hemmeter.**—Dr. John C. Hemmeter has been elected to the Professorship of Physiology in the University of Maryland, of which institution he is a graduate, as well as of Johns Hopkins University and the Royal Gymnasium at Wiesbaden.

**Smallpox Hospital Burned in Orange, N. J.**—Fire on July 2 destroyed the main structure of the group of buildings, erected at Heywood and Mosswood avenues in Orange at the time of the smallpox outbreak about two years ago and used as an isolation hospital, entailing a loss of $2,000. It was with difficulty that the firemen prevented the destruction of the other buildings, as there are no hydrants nearby and the fight had to be made with the chemical engine. Both Health Inspector William Schluer and Fire Chief Hodgkinson think the building was set on fire.

**Berlin Medical Society Reports on Tuberculosis Experiments.**—The Berlin Medical Society assembled on July 8 to hear Prof. Kossel of the Imperial Health Office report the results of the prolonged experiments of the Tuberculosis Commission in infecting calves with human tuberculosis. Prof. Koch's observations, prior to the celebrated London address, caused the Health Office to appoint the Commission to make systematic experiments. Yesterday's paper was in the nature of a preliminary report. The Commission's investigations cover three forms of introducing tubercle bacilli in calves—first, subcutaneous injection; second, in food, and third, by inhalation. The preliminary report covers only the first form, but the experiments with the other forms continue.

The Commission decided to attempt the inoculation of calves not with matter taken directly from human victims, but with cultures made therefrom. The experimentation covered 39 separate cultures, 23 from adults and 16 from children. The results were that 19 calves subcutaneously treated did not show the slightest effect, 9 showed, after four months, the slightest changes of condition, and 7 showed more marked symptoms, but the propagation of tuberculosis in the body did not occur. On the other hand, 4 inoculations from tuberculous children infected calves with a disease which resembled a weak type of animal consumption, and 2 of this number died from tuberculosis. The Commission summarizes as follows: "The series of experiments strengthens Prof. Koch's view that animal consumption as the cause of human consumption does not play the rôle generally attributed to it, but definitive judgment requires further experimentation." In the discussion which followed Prof. Orth, the late Prof. Virchow's successor, strongly combated the view that human and animal consumption were dissimilar and non-transferable.

**State Medical Licentiates.**—The annual meeting of the State Board of Medical Examiners of New Jersey was held at Long Branch, July 6. The following candidates, who passed the State examination held at Trenton, June 16-17, were granted certificates of license to practice medicine in that State: Leon Hamilton Bossert, Millville; Arthur W. Belting, Trenton; Joseph Howard Cloud, Ardmore, Pa.; Francis R. Di Matteo, Newark; John Edward Donley, Jr., Orange; Harry Stokes Doriss, Atlantic City; Joseph William Dwyer, Passaic; Edmund Eastwood, Burlington; Walter Roland Elliott, Philadelphia; Mary E. Esser, Philadelphia; James Aloysius Gormley, Vineland; Earl Stephen Hallinger, Camden; Pomp. Long Hawkins, Atlantic City; Charles R. Heed, Philadelphia; William Thomas Hilliard, Jr., Salem; Howard Franklin Hoffmeier, Phillipsburg; Smith Hamill Horne, Atlantic City; Charles Albert Keating, Jr., Paterson; Raymond Arndt Kiefer, Midland Park; Joseph William Kenney, Philadelphia; John William King, Jr., Newark; Edward Isaac Leonard, Atlantic City; Fred Irvin Longstreet, Manasquan; John Carmelia Loper, Bridgeton; Harry George Macdonald, Hackensack; Calvin Edward MacMillan, Lakewood; Emil Mantner, Newark; Harold Philip Martin, Newark; Thaddeus P. Martin, Atlantic City; Charles Holmes Mayhew, Port Elizabeth; Dennis Ralph McElhinny, Long Branch; Frederick W. A. Mayer, Jersey City; John Lewis Meeker, Newark; James Percival Morrill, Paterson; Edward Ralph Myers, Atlantic City; Marcus Ward Newcomb, Newport; Jeremiah Francis O'Connor, South Amboy; T. Richard Paganelli, Hoboken; Edward Parry, Camden; Thomas Heritage Platt, Jr., Bridgeton; Jacob Wilson Reed, Pleasantville; Siegmund Albert Reich, Jersey City; Joseph England Roberts, Jr., Camden; Edward Bancroft Rogers, Mt. Holly; Horace Lewis Rose, Camden; Israel Jay Rachlin, Newark; William Satterer, Newark; John Berkey Seeds, Trenton; Frank Remington Sheppard, Cedarville; William Rice Silverstein, Newark; Howard Sedgwick Smith, Newark; Katherine Louise Storm, Philadelphia; Edmund Brewster Terry, Atlantic City; Claude Wellington Thomas, Medford; William Hibbs Tomlinson, Trenton; Helen Frances Upham, Asbury Park; John Van Ess, Paterson; Joseph Smith Van Dyke, Cranbury; William John Ward, New Brunswick; Victor Egbert Watkins, U. S. Army; Absalom Steelman Wescoat, Atlantic City; Herbert Heisler Wilson, Bridgeton; Emanuel Yadcowsky, Newark; J. John Lee Young, Newark.

The following candidates, having attained a general average of 90 or over, were placed on the Honor Roll: Francis R. Di Matteo, Newark, 92; Jeremiah Francis O'Connor, South Amboy, 92; Howard Franklin Hoffmaier, Phillipsburg, 91.1; Joseph England Roberts, Jr., Camden, 91.1; Joseph Smith Van Dyke, Cranbury, 91; James Percival Morrill, Paterson, 90.6; John Edward Donley, Jr., Orange, 90.1; William Satterer, Newark, 90, and William John Ward, New Brunswick, 90.

**Medicine as a Profession in Austria.**—The Medical Congress recently held at Vienna revealed a sorry, and at the same time anomalous condition of affairs in the Austrian empire. Twenty thousand communities, or 86 per cent. of all, are so poor that they cannot afford regular physicians, and 30 per cent. of the dead (in Galicia 75 per cent.) are buried without medical certificate. Yet, while there is such need of doctors, the number of medical students is decreasing at a surprising rate. Of every 1,000 students in the Austrian universities this year, only 132 are in the medical departments. The total number of medical students is

only 2,120 as against 5,277 in 1888-89—a decrease of about 60 per cent. in a little over a decade. And the decrease is likely to continue. At the congress referred to, Dr. Wichmann earnestly warned all young men against choosing the profession of medicine; which, he declared, the Government had practically killed by its faulty laws in favor of the laboring man. Other speakers dwelt on the same point. They were not opposed to compulsory insurance against illness as such, but to the manner in which it is managed and to the abuses to which it has given rise, and which call for prompt remedies. From the country communities good physicians have long been excluded, because they cannot be supported there, and now that already one-third of the Viennese are taken from private practice by the Krankenversicherung and its underpaid employees, the outlook in the cities becomes hopeless, too. Quackery naturally increases under such circumstances, and the medical man's resources are further cut off by the fact that, thanks to his own hygienic reforms, the number of cases of illness is now little more than one-half of what it was twenty years ago.

**Deficit in Cod-liver Oil Supply.**—From private correspondence it is learned that there is likely to be a very great scarcity in the supply of cod-liver oil during the coming fall and winter. One of the largest and most reliable refiners of this product reports that it is becoming almost impossible to secure it at any price, and thinks his concern will have to suspend operations for several months. Heretofore most of the commodity has come from Norway, because of its exceedingly high-grade quality and relative cheapness, but under present conditions, although quite as many cod are available in that country as formerly, it is found that the livers contain either no oil at all or too small a quantity to be made use of. The reason for this deficiency is unknown, but has been supposed by some to be due to the volcanic eruptions and other seismic disturbances which have occurred during the past year, since these are known to interfere with the procuring of proper food by fish of the cod type. This, however, is an extremely doubtful explanation.

The oil obtained from the Newfoundland cod is not of as good quality, is scarcer, and costs $200 to $250 a barrel, whereas the Norway oil has been obtainable in past years for about $40.

**Bound in Human Skin.**—It may not be generally known that the late Dr. F. Stockton-Hough, of Trenton, N. J., who left a valuable medical library in several languages, had a fancy for bindings made of human skin. He owned at least six books thus bound. One of them, "Catalogue des Sciences Médicales, Bibliothèque Nationale à Paris" (1857-73), is a large, very thick quarto half bound in skin from the back of a man. The texture is quite coarse and does not even suggest human skin. On the fly-leaf of a second book, "Cowper on Impregnation" (1789), the owner wrote: "Bound in leather tanned from the skin of the thigh of Maria L., affected with encysted trichinæ, who died of consumption in the Philadelphia Hospital. She was an Irish widow, aged twenty-eight years." Maria L. furnished the binding for another book also: "Das Buch der Liebe, oder das Geschlechtsleben in seinem ganzen Umfange." A valuable private library in New York contains a fourth book, presented by Dr. Stockton-Hough to the owner. This third piece of the leather-tanned skin of Maria L. is Barles's "Parties de la Génération." "Recueil des Secrets de Louyse Bourgeois," the famous French midwife, a 12mo, is the fifth book, also bound in the skin of Maria L. The sixth, Drelincourt's "De Conceptione Adversaria," a 12mo, is half bound in tattooed skin from the wrist of a man who died in the Philadelphia Hospital. Dr. Stockton-Hough tanned the skin himself in every case. That taken from the back, where the muscles are well developed, is coarse-grained; that from the thigh resembles pig-skin so much that the novice could not call it correctly by name. These books are now in the Medical Library of the Philadelphia Hospital, of which the Stockton-Hough collection is now a part.—*The Critic.*

**Anthropological Society of Washington.**—The 347th Meeting was held May 12. Dr. J. Walter Fewkes, who recently returned from the West Indies, gave a brief account of his work in Porto Rico and Santo Domingo, reserving a fuller presentation till next meeting. The paper of the evening was by Dr. E. A. Spitzka, entitled "Cerebral Characteristics of Distinguished Men, with special reference to the late Major J. W. Powell." Following is an abstract: Dr. Spitzka reviewed previous records of brains of distinguished men and proceeded to a consideration of their chief characteristics, particularly the brain-weight and the surface morphology—both generally and with special reference to certain cortical areas. Dr. Spitzka had tabulated the brain-weights of ninety-seven men eminent in the professions, arts and sciences; compared with the series of "ordinary" brain-weights collected by Bischoff and Marchand, there was a relatively and decidedly greater number of heavier brains in the former series. In a further analysis it was shown that the brains of men devoted to the higher intellectual occupations, such as the mathematical sciences, involving the most complex mechanisms of the mind, those of men who devised original lines of research (Cuvier, Cope, Agassiz) and those of forceful characters like Ben Butler or Daniel Webster possess the heaviest brains. The increase in brain-weight during evolutionary progress is directly related to the increase of cranial capacity along with the development of brachycephaly. As for the cerebral surface appearances, the highly intellectual man is likely to exhibit not only a superior degree of fissural and gyral complexity in general, but of certain cortical fields in particular. These differences in the extent of certain cortical (especially the associative) areas are palpable and measurable. Particularly important in this relation is the insula (Island of Reil), probably the purest association center in the brain, and usually showing a superior degree of development in men whose powers of speech were of a high order. The brain of Major J. W. Powell (to be described in the *American Anthropologist*) exhibited a decidedly superior degree of development. Its weight, 1,488 grams, was above the average of the 97 brains of eminent men, and for a man below medium stature and of rather small frame and whose age was 68, it was notably above the average. The most notable feature is a redundancy in the subparietal association area (especially the angular gyre) on the right side, a feature which may not be unrelated to an important characteristic of Major Powell's mental make-up: that of keen observation and superior powers of generalizing these. A large number of charts and figures of brains of notable persons illustrated the paper.

In discussing the paper Dr. Frank Baker held that the convolutionary pattern of the brain is due to the needs of motor activity, and any conclusions from it as to brain power should be carefully weighed.

Professor W. J. McGee stated that Major Powell's strength lay in generalizing on observations in nature and that the address of Dr. Spitzka shows that it is now possible to trace a definite relation between cerebral structure and the psychical character of an individual. Dr. Ales Hrdlicka said that it is a well-known fact that every organ in the body, if more than

ordinarily exercised, receives an augmented blood-supply and in consequence tends in time to increase in size and weight. It would be very strange if the brain formed an exception to this law. It is true that the efficiency of a brain may increase by the advance of the differentiation of its minute elements, but in all probability this and actual growth go hand in hand, and the size and weight of the brain must be of considerable importance in the study of the organ. That no very definite results in this respect have as yet been generally arrived at is due to the fact that we are practically only in the beginnings of brain study and need many additional accurate data on normal material, and that not only in white but also in various more primitive peoples. We need many further data on the significance in brain study of race, sex, stature, muscularity, age as well as other factors. The significance of the convolutionary pattern is particularly in need of further investigation, yet it is a general opinion that a marked complexity of the convolutions goes with the superior brain and vice versa. Dr. Hrdlicka expressed a hope of establishing in the course of time a valuable brain collection in his division in the U. S. National Museum.—*Science.*

**Obituary.**—Dr. Thomas M. Rochester, who had practised in Brooklyn for twenty-five years, died on Sunday of consumption in the home of his mother, in Rochester, N. Y. His great-great-grandfather, Col. Nathan Rochester, was the founder of that city and some of his descendants have lived there ever since. Dr. Rochester settled in Brooklyn soon after his graduation from the Buffalo Medical College, and remained in practice there until the breaking down of his health, three years ago. He was prominent in the various medical organizations in Kings County and a member of the Oxford, Marine and Field and Reform clubs.

## SPECIAL ARTICLE.

### BYWAYS OF MEDICAL LITERATURE.—XV.

#### AN AMERICAN MEDICAL INCUNABULUM.

WHILE in New Orleans we had the pleasure of seeing what is surely one of the most precious bibliophilic treasurers of American medical literature. It is a true incunabulum of medical printing in America, being the first book ever printed and published in New Orleans. It is in the possession of Mr. T. P. Thompson, whose choice collection contains more of the important Americana relating to old Louisiana before and after its acquirement by the United States than any other private library in the country.

The book is a little work on medicine whose title is Medicamens et Precis de la Méthode de Mr. Masdevall Docteur Médecin du Roi d Espagne Charles IV. pour guerir tautes les Maladies Epidemiques, etc.—that is Remedies and a Brief Description of the Methods of Mr. Masdevall, Doctor in Medicine to the King of Spain, Charles IV., for the cure of all epidemic diseases. As the little book contains less than 100 pages the assumption that it contains remedies for all epidemic diseases is a striking assurance on the doctor's part. This is not all, however, for the title proceeds—and for the cure of putrid and malignant fevers of different kinds and for protection for them. Price, four escalinos. To be obtained at the establishment of Louis Duclot, Printer, at New Orleans, 1796, with permission of the government. The dedication is to Baron Carondelet, the Spanish Governor, at the time.

The most curious thing about the book is the utter confidence with which the author promises that his remedies will cure, not alone relieve, but absolutely cure, the severest forms of fevers. The modern physician is at once tempted to find out, if possible, what are the precious ingredients of these wonder-working prescriptions. He is scarcely surprised, however, to find that they are only ordinary drugs, most of them now used very commonly in so-called family remedies; practically all of them inert, though there is an appeal to antimony in various forms, on all possible occasions, that shows the desire of the doctor to give and the wish of the patient to take something that would have an immediate and striking (not to say moving) effect. Tartar emetic, butter of antimony and the antimonial mixture were evidently the old doctor's standbys in the treatment of fever, though there is also an opiate febrifuge that was apparently often prescribed. Cream of tartar was employed at the beginnings of fevers partly for its laxative and partly for its diuretic and diaphoretic effects. The practice of using it thus has not gone out yet, among the older physicians of the South especially, and might well be imitated by their younger colleagues. Among the simples employed for colds and the combination of which was guaranteed to be a sure cure for consumption (when did they not have a cure for consumption—in spite of the mortality) was a mixture of the decoction of coltsfoot, of the wild poppy, of creeping ivy (hedera terrestris), of maiden hair fern, and the finest honey. Curiously enough, the time for special medication in Dr. Masdevall's opinion was not the spring of the year, but the fall. After all, perhaps, it is not surprising that it was after the oppressive heat of the summer rather than their pleasant winters that the inhabitants of old New Orleans felt the sluggishness that is supposed to be an indication for active medication. The ingredients of the autumn medicine were the inevitable antimonial mixture some Rosolidi Kina (a mysterious drug of a century ago) and syrup of vinegar. The old doctor's confidence in his remedies must have been one of the most effective factors in the treatment of his patients if he really effected the cures he claims so glibly to be the sure result of his wondrous prescriptions.

#### AS OTHERS SEE US.

AMERICAN publications of all kinds have taken the occasion to say so much about Prof. Lorenz during the past few months, because of his pleasant visit to us, that it is not surprising to find that the good Doctor had something to say of us on his return to Vienna. At a meeting of the Doctors' Club, of Vienna, he made some remarks as to the peculiar customs he had noted in America. He deprecated especially the notoriety that had been given to him, since it prevented his moving around as freely as he would otherwise like to have done, since everywhere he went he immediately became the subject of remark. He had to deny himself the theater almost completely, though with true Viennese Gemüthligkeit he would have liked very much to have gone frequently.

One of the customs he found most difficult to understand in America is our habit of having our shoes shined in public. As the correspondent of one of our prominent New York dailies said in comment: "To the fact, or to what he thought was the fact, that we generally have this operation performed while the shoes are on our feet, he devoted almost as much space as to anything else he saw over here, which shows that a trifle that never would have entered our thoughts struck him as a most curious and interesting novelty. 'I have often,' he writes, 'put the question to Americans, why, if time is money, is it absolutely necessary for me to be present every morning when my shoes are being cleaned?' I would say: 'Why must I have my shoes on my feet when these are being cleaned and thereby unnecessarily lose a quarter of an hour's time?' The answer would be: 'Yes, it is curi-

ous, but that is the custom.' The dear personnel of the hotel had other things to do of greater importance. If you want to have your shoes cleaned you must go to the negro, or clean them yourself. Therefore, I would advise every one who intends to visit America to supply himself in advance with the necessary utensils for shoe cleaning, if he prefers his independence to his convenience. Then follows the queer statement that 'it may be interesting for the visitor to the University Club'—what University Club not specified—'to know that the cleaning of a pair of shoes in America is dearer than a dinner in this club. It is easy, therefore, to compute how quickly under such circumstances the cleansing would exceed the original cost of the shoes. Cleaning shoes is no bad business in America, and supports a man well.' Apparently the good doctor was very savagely 'touched' by the bootblack at some club, and acquired some wrong ideas therefrom. But, come to think of the matter, it certainly is strange that such a vast amount of valuable American time should be wasted in the way that troubled Dr. Lorenz, and, thinking again, there has been an unrecorded change of late years in the shoe-cleaning habits at hotels, if not in homes."

All of which goes to show that sometimes we need to see ourselves as others see us, if we would behold the real selves. Physicians must feel our absurd time-wasting custom in this matter more than others. Why should it continue?

### THE SACRAL SPOT IN CERTAIN RACES.

Those who are interested in the occurrence of various malformations and peculiarities in the sacral region will be attracted by the results of some observations of Frederic Starr among the Maya Indians in Mexico. It is well known that among the Japanese and other populations of the East as well as the Esquimaux and certain of the Chinese of the northeastern part of China, a distinctly pigmented spot exists over the sacrum in all children. This disappears sometimes during the course of the first year and practically always before the child has reached the age of two years. It is understood to be the result of the closing in of tissues over the cleft that exists in this region in the embryo and whose imperfect closure leads to the many anomalies that are known to occur over the sacrum.

Mr. Starr said that it is a tradition that every pure-blooded Maya Indian has a blue or purple spot upon his back in the sacral region. Observation among adults, however, failed to show its existence. An opportunity was presented to examine a number of children and in the series of cases the spot was found in every subject of pure Maya blood. The spot was not found, curiously enough, among mestizos, that is those of mixed blood. It is very evanescent among the Mayas, being very rarely found among individuals of more than ten months of age. The spot is variable in size, shape and position, but is always in the sacral region. In color it is blue or a bluish purple. The whole subject is interesting as showing some explanation of the many pigmentary and hirsute anomalies found among other races.

### VIVISECTION AND MORAL PRINCIPLES.

In the April number of *The Messenger* (New York), there is an article with the title "Is Vivisection Morally Justifiable?" which discusses the moral principles underlying the employment of animals for experimental purposes in order to obtain information with regard to disease and its prevention and cure. The article is written by Rev. Charles Coppens, S. J., the author of a text-book on Moral Principles and Medical Practice, and a lecturer on medical ethics at the medical school of Creighton College, Omaha, Neb. The article contains an excellent résumé of the objections urged on supposedly moral grounds against the practice of vivisection and shows the lack of basis for antivivisection argument. For those who are interested seriously in the subject, and who sometimes wonder whether there may not be some truth in the frequently asserted claim that vivisection is cruel and in itself immoral, the article will present a very satisfactory answer to doubts and difficulties.

Professor Coppens begins his statement of the subject by quoting the letter of Professor Keen, of Philadelphia, addressed to Senator Gallinger, and which stated the ground on which the medical profession demand that no bills shall be introduced into Congress limiting the practice of vivisection because of the hampering effect which such legal regulation would have upon the progress of medicine in this country, as it has already had in England. There is after this a very fair statement of the ethical objections usually made to the practice of vivisection with the answers to them. The Rev. Mr. Coppens' conclusion is as follows:

"Such appeals to sentiment rather than reason are constantly met with in antivivisection literature; but they are an unfair presentation of the real state of the question. While it may be pleaded that even one man's life is worth the sacrifice of many brutes—according to the saying of the gentlest of teachers, "Are you not of much more value than they?"—there is a stronger plea than this. For the purpose of vivisection is the saving of thousands and myriads of men from sufferings more exquisite than any brute can undergo; for mental anguish is far more painful than physical hurt. Let any sensible man compare in his mind the suffering and death of a horse or a dog, with the scene presented by the death-bed of a father or mother of a family, with the prospect of leaving the children orphans, and exposed to the ills of poverty and moral neglect, or the contagion of bad example. Then let him consider how many persons have been rescued from the approach of death by the assiduous labors of learned physicians who, but for vivisection, would have been powerless to afford assistance. There are living to-day countless poets, artists, statesmen, doctors, soldiers, clergymen, magistrates, etc., and multitudes of mothers of families whose lives would have been lost in sickness, or by wounds, or in the labors of childbirth, if vivisection had not furnished the knowledge which enables medicine to prolong their lives."

### PARASITES AND PEARLS.

Recent investigations have shown that most of the calculous formations within the human body are due to morbid processes set up by the presence of bacteria. It is now generally accepted that practically all the biliary calculi are due to the presence of bacteria and these bacteria can even be recognized by staining and other methods in the center of the calculus. In fact, calculi have been produced in animals by the introduction of bacteria into the gall-bladder. Pancreatic calculi are also thought to be due to bacterial action. The various calcereous degenerations within the body are also now recognized to be the result of the chronic inflammation due to the presence of bacteria and nature's conservative effort in effectively walling off such micro-organisms so as to prevent their getting into the lymphatic or blood circulation.

Some recent observations reported in the English scientific weekly, *Nature*, seem to show that the formation of pearls instead of being due, as has been thought, to the presence of any irritant, are due to a specific parasite which, after having gained an entrance into the shell of the pearl oyster, sets up a special irritation that results in the deposition of the pearly material in the globular shape so familiar to the lover of jewelry. Other irritants, it is well known, will cause the deposition of

this material but never in the beautiful form which it takes as the result of the presence of the parasitic worm described by recent observers. The Japanese are accustomed to obtain little pearly images of Buddha, by depositing metal models of the god in the shells of pearl oysters but these are scarcely more than pearly in appearance and cannot be spoken of as true pearls. The present discovery will, it is said, revolutionize the pearl-fishing industry by making it possible directly to control the formation of the precious stones on the fishing beds.

NUTMEG AS POISON AND ABORTIFACIENT.

AN English practitioner recently reported a case in which a whole nutmeg was taken with the idea of producing abortion or at least bringing on menses delayed in a case with suspicion and fear of pregnancy. The result was severe symptoms of narcotic poisoning. His communication is worth giving in brief, for its interest. We quote it from Squibb's *Ephemeris*, Vol. VII., No. 1, 1903: "Quite recently I was called during the night to see a young woman who was stated to be 'in a fit.' I found her in a collapsed condition, muttering unintelligibly; her extremities were clammy, her pulse was hardly perceptible, and her pupils were somewhat dilated and reacted feebly to light. The symptoms were suggestive of alcoholic poisoning but her breath smelt unmistakably of nutmeg and I then elicited that she had taken a whole nutmeg, grated, in a wineglassful of gin an hour or so previously. On asking her friends why she had done this I was told that 'she was so afraid of having another child.' It appeared that the catamenia had been delayed two weeks and, dreading pregnancy, she had taken the advice of some female friend with the result above mentioned. I afterward made some inquiries and learned that there is a prevailing impression among the domestic servant class that nutmeg is an emmenagogue, although such a large dose is perhaps unusual. Her general condition improving I contrived to empty her stomach of its contents. She remained in muttering delirium throughout the night and slept heavily nearly all the next day, when she awoke apparently recovered. The catamenia followed accompanied by much pain.

The impression that nutmeg and, curiously enough, this time, too dissolved in gin, is an abortifacient is evidently not confined to England, for in the London *Lancet*, Vol. I., 1902, p. 1798, Dr. S. Maberly Smith, of Geelong, Victoria, Australia, reports a similar case. As it is not unlikely that the tradition in this matter has penetrated also into America, we quote the details of the Australian case also:

"Some years ago I was called to see a woman who had taken the whole of a ground nutmeg mixed with gin. The symptoms were exactly the same as those described by Mr. Pitter, and the woman nearly died. The dose was taken to procure abortion; whether it had that effect I did not learn. The friends volunteered the remark that the woman had taken the nutmeg in spite of the fact that a neighbor had nearly died from the same cause shortly before. At the time I asked a good many friends, medical and lay, if they knew anything of the poisonous properties of nutmeg in large doses. None of them did except one old lady from the north of England, who stated that she and people in her part knew them well. Squire states that nutmeg in large doses is a narcotic poison."

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**Typhoid at Ithaca.**—Following the energetic work of Dr. Geo. Soper on the water supplies of Ithaca, typhoid had been practically eradicated. This week, however, some new cases have developed, and at the present time there are 9 patients with the disease.

## SOCIETY PROCEEDINGS.

### NORTHWEST MEDICAL SOCIETY OF PHILADELPHIA.

*Stated Meeting, held May 5, 1903.*

President, Wm. Egbert Robertson, M.D., in the Chair.

**Treatment of Tapeworm.**—This was the subject of the paper read by Dr. Samuel P. Gerhard, in which he called attention to the three specimens which were most commonly met with, *i.e.*, the beef tapeworm or *Tænia saginata*, the pork tapeworm or *Tænia solium*, and the broad tapeworm or *Bothriocephalus;* the former being the one most commonly met with in this country. He called attention to the necessity of thoroughly cooking the meat before it is eaten, which, together with cleanliness on the part of those engaged in handling it, and systematic and regular inspection of the cattle and the meat after it is in the market, he believed would materially decrease the number of cases of this condition. He remarked upon the difficulty in removing the worm and considered that the treatment which was applicable to worms of one character was applicable to all. The preparation of the patient prior to the administration of the remedy he considered a most important factor. The patient should be required to fast for twenty-four hours before the medicine is administered, during which time the bowels should be thoroughly emptied by means of purgatives. Among the drugs mentioned were the male fern, kouso (the latter being liable to produce severe nausea and vomiting in some cases), the bark of the pomegranate, together with its alkaloid, pelletierine. The last two, however, are very impalatable and may produce toxic effects in doses large enough to be effective. Oil of turpentine was formerly used to a great extent, but owing to its nauseating taste and difficulty of administration has somewhat fallen into disuse. Kamala is a very active drug, but its use is contra-indicated, because it causes nausea and vomiting in many instances. Powdered pumpkin seeds were thought to be a valuable and harmless remedy, especially in children. He emphasized particularly the importance of removing the whole worm in all cases, as if the head or any of the segments remain it will develop again in from six to eight weeks. He believed that the great drawback to the administration of many of the remedies was the very large dose required, being in some instances as much as a pint of a bitter, nauseating liquid, to be taken at one or two draughts, necessitating loss of time, and being a very serious matter with a weak and debilitated patient. He reported a method which he had found very satisfactory. The patient is instructed to thoroughly clean out the bowels by purgatives the day previous to the administration of the remedy. In the morning, as early as possible, a 20-grain capsule of pelletierine tannate is given, and after this has operated fully, which is usually in about two or three hours, the following prescription is administered:

Olii Resinæ Aspidii.....drams, ij
Ether.....drams, ij
Hydrargyri chloridi mitis...grains, xij

This is divided into sixteen capsules and one given every ten minutes, no food being taken. In about two or three hours the worm will be expelled whole with its head intact. He stated that he had recently employed this method in seven cases with very satisfactory results, the depression is generally very slight and does not last longer than two or three hours, and if it does exist, light food can be administered after the worm is expelled.

**Intestinal Parasites.**—Dr. L. Napoleon Boston gave a microscopic exhibition of intestinal parasites,

consisting of the beef worm, *Trichina, Echinococcus* and *Anchylostoma*, the latter being the parasite which is supposed to be the cause of the anemia among the bricklayers and other people of the lower classes, in many instances, and which examination of our army in Porto Rico revealed that 30 per cent. of all the cases of anemia were due to this parasite.

Dr. A. C. Morgan, in discussing these papers, stated that he had used the remedies recommended therein with very satisfactory results. He believed that a positive diagnosis of tapeworm should not be made, unless the segments were found in the stool, although the larva are not discoverable there. He referred to the predisposition of the embryo of various worms to lodge in the pectoral muscles, the biceps, the diaphragm and particularly under the tongue, and in a patient suffering from what is apparently muscular rheumatism, but in reality larva, there will be irregular temperature, some fever, and increased pulse. Interference with the action of the diaphragm, tenderness of the various muscles and symptoms of pleurisy are also important diagnostic symptoms. He believed that the oil of turpentine was contra-indicated if the kidneys were not in perfect working order.

**Difficulty of Diagnosis.**—Dr. Samuel Wolfe referred to the difficulty of diagnosis of this condition, as the various forms of intestinal parasites do not give rise to particular symptoms, and the conclusion can probably only be positively reached after seeing a worm, and the condition may exist for a considerable time without any being passed. He felt that they were more apt to occur during some acute infectious disease, or some decided constitutional disturbance, especially when the disease has assumed the malignant form, he having observed in several instances during the infection worms were passed in very large numbers. In cases of tapeworm, he believed, if the worm was of any size segments would usually be discoverable in the stools.

Dr. Luther C. Peter referred to a publication which he had recently read attributing the poisonous effects to the castor oil, which was administered in most cases.

Dr. Gibbon reported the case of a child, who during the three or four months previous to the passing of segments had been given raw Hamburg steak. He also referred to a case which had come under his observation in the Children's Hospital, where a child was seized with coughing and the nurse removed one or two large worms from its mouth. He believed that the migration of the worms was particularly common in typhoid fever, in some cases causing the perforation.

Dr. Harry Lowenburg reported the case of a Polish child which was brought to him a short time ago suffering from hematemesis. Being familiar with the fact that these people fed their children on raw pork, he at once administered an emetic, which was followed by the vomiting of a large round worm, about four inches long, after which all the symptoms disappeared.

Dr. Charlott reported the case of a girl operated upon in the German Hospital, after which she vomited a large number of worms.

Dr. Arthur P. Hitchens suggested the possibility of the remedy being absorbed before it reached the intestinal tract unless it was given in capsule form, which method he believed would be the most efficient.

Dr. Wm. Egbert Robertson recommended the more frequent examination of the stools, which he believed would lead to the detection of the ova of the round worm in many instances. While the flat worm is rare in children, he referred to a case reported by Dr. D. J. Milton Miller, occurring in a child eight months old, which was supposed to be infected by feeding it on expressed beef juice.

Dr. L. Napoleon Boston, in closing, stated that in cases of trichina there is always a swelling and pain in the frontal region. He believed that the *Oxyuris vermicularis* was quite as common in adults as in children, and while the habits of the patient may have a great deal to do with its occurrence, he did not feel that the social class had. Examination of the rectal mucus prior to the commencement of treatment was recommended in all cases.

Dr. Samuel P. Gerhard believed that many cases were diagnosed as *Tænia solium*, which in reality were worms of a different character. He believed that the reason this condition was not so prevalent in this country was due to the fact that people had been taught to cook pork thoroughly, while they eat raw beef, which accounts for the more frequent occurrence of that variety. Ether he believed to be of value as it tended to stupefy the worm and in that way facilitate its removal, and he also felt that it was important that the worm should be passed into a vessel of warm water, as if the temperature is lower than that of the intestinal tract it is liable to recede.

*Stated Meeting, held June 2, 1903.*

The President, Wendell Reber, M.D., in the Chair.

SYMPOSIUM ON EPILEPSY.

**"The Treatment of Epilepsy"** was the title of a paper read by Dr. Luther C. Peter, in which he directed attention to the fact that the treatment of the disease must be largely prophylactic, first by preventing the causes which give rise to the convulsion and, second, by preventing the subsequent convulsions, with the consequent mental and physical changes. He believed that much more could be done for the patients by careful attention to the diet, daily bath, sleep and environment, especially in children, than by medical measures, and these measures are particularly important if the child has a neurotic predisposition. He stated that after observing over 2,000 cases of nervous disorders in children in his Clinic at St. Joseph's Hospital, and in private practice, he believed tea and coffee acted in many cases as inducing factors, and in some cases were the only causes of epilepsy in children; the great amount of mental work done by children with the present school system, he believed also was accountable for a considerable number of these cases. After the epileptic habit is formed, he believed the general management of the case to be just as important a factor, and while he believed that drugs played an important rôle in the cure of these cases, he felt that the general management was the most important factor of every complete recovery. The food should be chosen with especial reference to the individual requirements of the patient, and the condition of the digestive organs, and as a rule any easily digestible and assimilated food may be employed, provided its use is not followed by gastro-intestinal disturbance, as deranged stomach or intestinal fermentation is liable to produce a convulsion. If the patient's occupation does not particularly require meat, it is a good plan to restrict the amount taken. The author recommended the closest scrutiny of all parts of the body in order to detect any cause for the epilepsy and stated that he had seen cures follow the correction of refractive errors, removal of adherent foreskin, removal of constipation, etc., the success depending entirely upon the early recognition of the condition and removal of the cause. The toxic form, including the alcoholic type, he believed to be especially amenable to general treatment. It is pretty generally conceded that the convulsion has its origin in the cortical cells, and, therefore, the class of drugs which do the most good are nerve sedatives, the drug most exten-

sively used being the bromide salts. He stated that he believed in many instances the mental dulness was due more to the excess of the bromides than to the epilepsy and referred to the fact few patients could take this remedy in larger amounts than 30 to 40 grains per day without producing bromidism; the addition of several drams of infusion of digitalis often intensifies the sedative action, without aggravating the bromidism; a minim or two of Fowler's solution will prevent the acne. Chloral will act beneficially for a time in controlling the convulsions and if the patient has mental warning of the approach of an attack and it is given in sufficiently large doses it will often prevent the convulsion. He stated that he had used the fluid extract of solanum in a considerable number of cases, and in adults had found that as good results could be secured with from 2 to 4 drams of this drug as from 10 to 15 grains of potassium bromide, and its use can be continued indefinitely without the depressing mental effects. Its use has been followed by equally gratifying results in children, who usually stand the bromides so poorly. In those patients who have a considerable period of premonition, inhalation of nitrite of amyl is of much value.

**"The Diagnosis of Atypical Epilepsy."**—This was the title of a paper read by Dr. A. C. Buckley, in which he called attention to the necessity for early diagnosis and correction before the nervous mechanism had formed the epileptic habit. After giving in detail the symptoms of a typical attack of epilepsy he stated that there were many cases which were not recognized for months or perhaps years, owing to the fact that the attacks may be of such a nature as not to be noticed by the patient or his family, or may occur only during the sleeping hours, when, except for the fact that he feels fatigued and has marked muscular soreness upon awakening, the patient, when he seeks medical advice, is not aware of his true condition. He believed that the minor attacks were less responsive to treatment than the major attacks, although there is no strict line of demarcation between the two. The minor attacks usually consist of momentary unconsciousness which very often is not recognizable, and it is in these minor attacks that the greatest deviation from the set symptoms occur. Nocturnal epilepsy, when the symptoms are not sufficient to be recognized by the patient, can only be diagnosed by the after-signs, such as soreness of the tongue, usually on one side, frequently bloodstains on the pillow, if the tongue has been bitten, minute conjunctival extravasations, voiding of urine in bed, and even these are frequently absent. He believed that a confusing factor in diagnosis was the differentiation between the minor epileptic attacks and syncopeal attacks; the epileptic attacks occur independent of the surroundings and in the absence of any predisposing causes, such as emotion, physical exertion, overheated rooms, hot, humid weather, etc., which frequently produce syncopeal attacks. In the latter condition there is usually an irregular pulse and clammy skin which is not present in epilepsy. In epilepsy the loss of consciousness is sudden and complete and returns quickly, while in syncope it is usually preceded by a subjective feeling of faintness. Epilepsy may be preceded by an aura which may be described as a feeling of faintness, but there is usually associated with it a sensation of fear or strangeness which is not present in syncope. Distinct vertigo is in favor of epilepsy, although care must be taken to distinguish the vertigo from dizziness, which is sometimes present in syncope. He considered the automatic type of epilepsy of great importance. He believed that hysteroid could usually be distinguished from epileptic seizures by the fact that the former are usually coordinated.

**Etiology of Epilepsy.**—Dr. Charles W. Burr referred to the fact that the etiology of epilepsy was still very much in the dark, and believed that the greatest hope lay in the prevention rather than the cure of epilepsy, and in children predisposed to this condition, it is especially important that they should live out of town, have nourishing food and avoid mental overwork. He believed that alcohol played a considerable rôle in the production of epileptic seizures and reported the case of a shoemaker, who would have attacks only after a drunken debauch. He felt that many of the cases of dementia were much accentuated by the long-continued use of bromides, and while he had not attained very good success with horse-nettle, thought this fact could probably be accounted for in that he had not given it in sufficiently large doses. In regard to diet, he did not believe that the patient should be required to forego red meat altogether, although he felt that its use should be restricted. He referred to several cases of postepileptic automatism, one man would go through the motions of pulling a rope for three or four minutes very time he would have an attack, and he expressed the opinion that in some instances this condition was responsible for the perpetration of innocent crime.

**Careful Study of the Aura.**—Dr. Samuel Wolfe, felt that a careful study of the aura in connection with the sensory nerves might reveal something in regard to the etiology of the condition and expressed the opinion that the attack originates in the peripheral sensory nerves rather than in the cortical cells. He referred to the fact that a large number of curious conditions have been recognized as epileptic equivalents, directing particular attention to the fact that an Italian writer had recently advanced the theory that a good many of the cases of tachycardia are really cases of epilepsy, and reported a case of tachycardia which had recently come under his observation, which he rather inclined to think was of this class. In the treatment of epilepsy he believed the bromides to be the foremost remedies, and if bromidism occurs, the addition of one or two drops of Fowler's solution with each dose is of value. Atropine is also frequently of advantage in conjunction with the bromides.

**Pupillary Incoordination and Hypermetropic Astigmatism.**—Dr. Wendell Reber stated that he had made a careful study of the ocular condition of about fifty epileptics for about a year, and found pupillary incoordination in about one to three. Optical imbalance in about 35 per cent. and in a good many hypermetropic astigmatism was present. He did not attach much importance to these eye conditions, however, as all of them frequently exist in other conditions. He referred to the fact that the majority of epileptics were great overfeeders and not very active.

Dr. Lewis H. Good reported a case of a man who became intoxicated and after he went home fell over in a fit; after this was over he was very violent for about an hour, breaking up furniture, etc., after which he fell into a deep sleep or comatose condition. He also reported another case, apparently hysterical, in which the symptom is incessant talking for about half an hour, the acts being both nocturnal and diurnal. The patient was run over by a wagon when a child and at puberty had amenorrhea and dysmenorrhea, since which time she has had these attacks.

Dr. Solomon Newmayer referred to the rarity of the occurrence of epilepsy among the Hebrew race. He reported the case of a man who was suddenly taken ill on a very hot day; he became unconscious had a temperature of 104° F. and spermic fever was suspected and the usual treatment applied. After about an hour he revived, the case proving to be one of epilepsy.

J. Frank Wallis reported three cases of convulsions, one of which he attributed to the patient eating cabbage, the other to eating sausage and pretzels, and the third to the fact that the patient had eaten a very hearty dinner. All of these cases were relieved by rectal injection, and the suggestion was made as to whether they were cases of true epilepsy or not.

**Removal of Obstructions of the Nasopharynx and the Ear.**—Dr. Nathan G. Ward referred to cures that had been reported by the removal of obstructions of the nasopharynx or by the removal of obstructions from the ear, the condition in most of these cases being obstruction or deflection of the septum, adenoids, enlarged tonsils, and a few cases of pharyngeal abscess and suppurated ears. He believed that the greatest good could be secured by the use of prophylactic measures tending to prevent the attacks.

**Cold Water Treatment.**—Dr. Charles C. Biedert reported the cases of two brothers, both of a neurotic temperament, in which the attacks were frequently superinduced by disputes with their wives; in which the cold water treatment was administered with gratifying results. He also referred to a case caused by alcoholism which was benefited by this same method.

Dr. Howard S. Kinne felt that a very important factor in the prophylactic treatment of epilepsy was the placing of all infants on a properly nourishing diet, as nearly similar as possible to the mother's milk; and believed that one reason why epilepsy was less frequent among the Hebrew race was owing to the fact that the mothers usually nurse their children. He did not believe that alcohol played a very important part in the production of epilepsy in the subject itself, but was more manifest in his descendants.

**Convulsive Attacks Produced by Bradycardia.**—Dr. William Egbert Robertson called attention to the fact that convulsive attacks produced by bradycardia are very similar to the epileptic seizures. He believed that too often convulsions in children were attributed to teething and very little attention was paid to them, which he felt accounted for at least some of the cases of epilepsy. He felt that tea and coffee played but a small rôle in the production of epilepsy in those not predisposed to the disease.

Dr. Luther C. Peter, in closing the discussion, stated that he did not believe solanum to be any better drug than bromide, but its greatest merit consisted in the fact that it could be given in sufficiently large doses to benefit the patient for a long time, without producing any mental effects. In regard to alcohol as a causative factor, he stated he had three cases under his observation at the present time who were subject to the seizures only after a debauch, but did not feel prepared to say that this was the cause of the epilepsy.

## NEW YORK NEUROLOGICAL SOCIETY.

*Stated Meeting held April 7, 1903.*

The President, Pearce Bailey, M.D., in the Chair.

**Birth Palsy—Syringomyelia.**—Dr. Edward D. Fisher presented a man, twenty-five years of age, who had had a birth palsy, apparently the result of a tedious labor and a forceps delivery. There were present the characteristic athetoid movements, but the epileptic attacks had ceased in childhood. When fifteen years old he began to notice a wasting of the muscles of the left hand and forearm along with some disturbances of sensation. Subsequently the right hand became similarly affected. On examination, there was found to be almost complete loss of pain and temperature sense, and the tactile sense was not good. There was no sensation on either side to the strongest faradic current. There was absolute loss to both the faradic and galvanic currents in both hands. In the forearm there was a diminished reaction. The condition just described had progressed slowly during the past ten years. The reflexes were greatly exaggerated on both sides. The case had been previously diagnosticated as progressive muscular atrophy, but he would make a diagnosis of syringomyelia, quite probably originating in a slight spinal hemorrhage. The patient was very intelligent and in perfect health. He had presented no bulbar symptoms.

Dr. B. Sachs thought the association of syringomyelia with an infantile cerebral palsy was unique. The suggestion of a hemorrhage occurring simultaneously into the cervical portion of the cord at the time of the cerebral palsy appeared to him a good one. Recently cases of congenital spastic paraplegia had been reported which were known to have been produced by hemorrhage into the cord lower down. The speaker said that a few days ago he had seen a case of apoplexy in an elderly person resulting in a left-sided hemiplegia. After a few days very slight motion returned in the left hand, and he was astonished to find that he could secure fairly good motion of the paralyzed hand when asked to close the other hand. This observation was a common one in children, but he had not before noticed it in adults.

Dr. Pearce Bailey said that a few years ago Schultze described hemorrhages into the spinal cord occurring in young infants in connection with difficult labor, and the subject had assumed a medicolegal interest. In the cases of hematomyelia that he had seen he had never been able to observe them long enough to see the progression of the symptoms.

**Suture of Popliteal Nerve: Perfect Restoration of Function.**—Dr. Russell A. Hibbs presented a boy, fifteen years old, who had come to the Orthopedic Hospital on October 6, 1902, with a history of having fallen upon a knife several weeks previously and injured the leg. On October 9 he was operated upon, and on exposing the site of the injury it was found that the popliteal nerve had been divided. It was accordingly sutured with a practically perfect result. While the voluntary power in the muscles supplied by this nerve was lost there was still some sensation, which was apparently accounted for by the fact that a few fibers of the nerve remained intact. The limb was kept slightly flexed for six weeks after the operation.

Dr. M. Allen Starr thought surgeons as a rule did not recognize the great importance of suturing nerves at the time of such injuries, for, it was not uncommon for persons so afflicted to seek relief a considerable time after the injury. There could be no question that a divided nerve would not unite spontaneously in the majority of cases, and it was equally certain that by nerve suture a good result was usually secured. He had seen one or two interesting cases in which nerve suture had been essayed in children in whom the brachial plexus had been injured at birth. Four successful cases of this kind had been recently reported. The operation consisted in laying bare the brachial plexus, finding what nerves were torn and uniting them.

Dr. William M. Leszynsky said that in injuries of the hand special care should be taken to determine whether or not the nerves had been injured. He had recently seen a case in which the divided tendons had been sutured and the divided ulnar nerve had been entirely overlooked. As a result, a neuritis of this nerve had developed before he saw the case. Although rather late an operation had been advised in the belief that even late operations were often successful.

Dr. Fisher said that he had had under observation for some time a facial paralysis that dated from childhood,

the patient being a woman of thirty. After awhile a faradic response from the facial muscles was obtained; hence, he thought one could hardly place a time limit after which nerve suture would afford but little prospect of benefit.

Dr. Hibbs said that in his case the original wound had been sutured at a hospital, but the nerve injury had not been noticed.

**Paralysis Agitans (?)**—Dr. J. Ramsay Hunt presented a man of forty-three years, a cigar roller by occupation. The present affection dated back four years. It had first been noticed that the right hand was weak and tremulous, but he had continued at work for three years. Last July the head also became tremulous and the right leg felt heavy. When first seen, about one month ago, examination showed tremor of the right hand without rigidity; a slight atrophy of the right forearm; a tendency to monotony of speech and a rather expressionless face. The question arose as to whether this was an occupation atrophy or, as he was inclined to believe, a case of paralysis agitans.

Dr. Hunt also reported a case at the Montefiore Hospital which had presented the characteristic picture of paralysis agitans for several years before death. An autopsy of the brain was alone permitted. The vessels showed marked arteriosclerosis. There was an excessive degree of pigmentation and some rounding of the processes of the cells in the cortex and in the portion of the cervical cord removed for examination—in short, those changes that had been regarded as occurring frequently in paralysis agitans. The specimens were exhibited under the microscope.

**Elephantiasis Ossium.**—Dr. I. Abrahamson presented a woman, aged thirty-six years, showing a peculiar glossy appearance of the skin of the forehead and a remarkably wide supra-orbital ridge. Examination revealed a ptosis of the right eye, a double divergent squint and a marked contraction of both inner fields of vision. According to her husband, the changes in her outward appearance had been progressive. The malar bones were enlarged, and apparently the hands and feet were growing larger. The condition was possibly due to luetic disease of the apophysis because there was specific disease of the eyes.

Dr. Starr remarked that the appearance of the eyebrows pointed strongly to the case not being one of acromegaly or myxedema, but of elephantiasis ossium. The case appeared to be in an early stage.

Dr. Leszynsky said that acromegaly could be excluded by the condition of the visual field, as in that disease there was usually a bitemporal hemianopsia.

**Paralysis Agitans—Discussion.**—Dr. B. Sachs said that he was of the opinion that this was distinctly a disease of the senile period. In this period the two most important factors were emotional excitement and some prolonged and exhausting disease. The point of differential diagnosis to which Charcot had attached so much importance, the non-involvement of the head in paralysis agitans and its involvement in multiple sclerosis, seemed to him a point not well taken, for he was sure he had seen involvement of the head in fully 75 per cent. of cases of paralysis agitans. Charcot's attempt to differentiate sharply between these two affections seemed to him to have been carried beyond a justifiable limit. He had seen cases giving the symptoms of multiple sclerosis, and yet later on develop a distinct picture of paralysis agitans. There was a young man at the Montefiore Hospital whom he had first seen when only about eighteen years old, and who developed the typical carriage, tremor and speech of paralysis agitans. As the years went on he developed nystagmus and a marked exaggeration of all of the reflexes, and his speech was now as much that of multiple sclerosis as of paralysis agitans. He also recalled the case of a young woman first seen by Professor Mendel in Berlin, who made the diagnosis of hysterical tremor. When seen by the speaker, a few months later, she presented what appeared to be the first symptoms of multiple sclerosis. At the present time, she presented the typical picture of paralysis agitans. This experience led him to think that there must be some relationship between these two diseases, and the case presented this evening by Dr. Hunt gave color to this view. With regard to the treatment of paralysis agitans he was accustomed to make use of hyoscin and the ordinary sedatives, and probably all present believed that no drug did much good. The only treatment that was fairly satisfactory was the use of some form of vibratory therapeutics.

Dr. Stuart Hart said with regard to the records of Dr. Starr's clinic at the Vanderbilt Clinic, that out of 219 cases of paralysis agitans there recorded 139 were males and 80 females. Under thirty years of age there developed 2 cases, both males. The disease commenced in 88 cases between fifty and sixty years of age. Among heavy workers there were 45 males; among those particularly exposed to cold there were 24 cases; among the lighter trades there were 24 cases; among those working in factories were 14 cases. In 6 cases it was stated that the mother had paralysis agitans, and in three the father was said to be so affected, while in several other cases brothers or sisters were said to be similarly affected. Forty patients believed that the disease arose from anxiety or worry, and half of these directly attributed it to fright. In quite a number of instances the history stated that the tremor had developed very shortly after some trauma of the part first exhibiting the tremor.

Dr. Joseph Collins presented an analysis of 50 cases of paralysis agitans. Of this number, 34, or 68 per cent., were males, and 16, or 32 per cent., females. The average age at which the disease developed was 51½ years, the youngest being thirty-two and the oldest seventy-two years old. They were divided according to occupation as follows: Merchants, 7; workmen, 8; laborers, 5; tailors, 4; clerks, 1; clergymen, 1; drivers, 1; carpenters, 1; plasterers, 1; engineers, 2; gardeners, 1; houseworkers, 9; captains, 1; no occupation, 7. The nationalities were: United States, 8; England, 1; Ireland, 16; Germany, 7; Holland, 1; Russia, 6; Austria, 1; not given, 10. The attributed cause was: Worry, in 7 cases; alcohol, 1; excesses, 1; excitement, 1; shock, 1; refrigeration, 1; hard work, 1; pneumonia, 1; grief, 1; bite of cat, 1; unknown, 34. In 7 cases there was a history of injury; in 1 of operation; in 1 of hard work; in 1 of syphilis; while in 40 cases there was no special history of this kind. There was a history of neuropathic heredity in 13 of the cases, of 26 per cent., and a history of paralysis agitans in the parents or uncle in 6 instances. The average duration when first seen was four years, the longest being twenty years and the shortest five months. The part to first show trembling was left upper extremity in 11 cases, left lower extremity in 8, right upper extremity in 15, right lower extremity in 1, upper in 7, lower in 2, right upper and lower in 1, left upper and lower in 1, and all extremities in 4 cases. The initial symptom was: trembling in 24 cases; pain in 11, unsteadiness in 3, numbness in 2, nervousness in 1, stiffness in 1, inactivity of fingers in 1, weakness in 1, loss of power of right hand in 1, headache in 1, and not given in 4 cases. The relation of curvature of the spine was investigated specifically in only the last 20 cases, and was noted in 7 cases. He was convinced that paralysis agitans was a disease of early senility occurring as the reward of virtue.

Dr. M. Allen Starr said that he had had a fairly large experience with paralysis agitans, yet it did not bear out

Dr. Collins' statement about the frequency of the disease among the Celts and its comparative rarity among the Hebrews. He could recall quite a large number of patients among the Jews and a number among the Germans. In hospital and clinic work one was apt to get a one-sided view of such matters because of the large proportion of persons of certain nationalities at such places. Nor did his observations bear out what the last speaker had said about heredity; probably four or five per cent. would represent the proportion showing hereditary influence. Anxiety and trauma appeared to him to bear a distinct relationship. He had never seen a patient absolutely cured of paralysis agitans, but he had observed a very marked improvement in one, and a great variability of symptoms in a number of other cases. The disease did not appear to be a steadily progressive one. He had found that the Swedish massage, skilfully administered, after a prolonged hot bath, gave these patients so much relief that they were willing to keep up such treatment for years. The great majority of his patients had found benefit from hyoscine in doses of 1/100 of a grain, given from two to five times a day.

Dr. Leszynsky said that dispensary and hospital patients were not benefited, but with private patients it was quite different. Four times within the past ten years he had had the opportunity of making the diagnosis very early in the disease. The disease certainly presented remissions at times, and traumatism certainly exerted a distinct influence. Most of these patients were very amenable to suggestion, and in this way could be benefited by treatment. He had not observed good effects from hyoscine except for a very short time, because most of the patients complained of the action of this drug. As systematic exercise had been recommended he had tried the Swoboda system of exercises, which call for voluntary effort entirely, and the patients appeared to be benefited thereby.

Dr. Joseph Fraenkel said that in the past ten years he had seen many cases of paralysis agitans and had witnessed 10 autopsies. It was rare to find a person suffering from paralysis agitans who was gray-haired or old-looking, and the autopsies showed a remarkable freedom from arteriosclerosis. These persons were rarely addicted to the use of alcohol or exhibited evidence of syphilitic infection, and to this extent he would indorse Dr. Collins's statement that this disease was "the reward of virtue." He saw nothing to support the theory that this was a disease of senility. It was common to observe a marked hypertrophy of the skin in these patients. A characteristic feature was the difficulty of stopping the patient when on any one line of thought and change him to another. A pseudonystagmus was often observed. Although the tremor ceased at night, the paralysis agitans patient presented the same attitude in sleep as when awake. He agreed with Dr. Collins that very little could be done for these patients by treatment of any kind.

Dr. Harlow Brooks said that he had only studied four cases of paralysis agitans post mortem, and the findings were so conflicting that he was very skeptical about any lesions claimed to be characteristic of the disease. He was of the opinion that deformity of the spinal column was very common in persons who were not very well developed, basing this opinion upon many observations made in the deadhouse as well as in examining during 1898 the recruits for service in the regular army. He thought that fully 7 out of 50 such recruits would show as much spinal deformity as Dr. Collins's cases, even though these persons were of sufficiently good physique to be accepted in the army.

Dr. Collins said that his statistics with regard to the Celts might be refuted, but to do so the actual figures must be presented and not cases recalled from memory. He believed also that the more paralysis agitans was treated the worse it became.

Dr. Hunt said he understood that the premature senility referred to the nervous system, and not to the arterial tree when used in connection with paralysis agitans.

Dr. Pearce Bailey was of the opinion that two-thirds of the cases of paralysis agitans began after the age of sixty. A disease which could become fairly well developed in the course of a few weeks could hardly be regarded as an organic disease of the nervous system, and he was inclined to think that the evidence was rather in favor of its being a disease of the muscular system, resulting possibly from the action of certain toxins. He believed it was distinctly induced by trauma, either psychic or physical, for there were too many definite and striking clinical records of this kind. The disease usually first appeared in the hands, and yet in cases of injury to the legs the disease was more apt to begin in the legs. A large proportion of the persons coming to Dr. Starr's clinic suffering from paralysis agitans were apparently right-handed workers.

**Specimen of Brain Abscess.**—Dr. Joseph Collins presented this specimen removed from an Italian laborer, forty years old, who had not been sick up to two months before his admission to the City Hospital, since which time he had suffered from headache only. On January 14 he became stuporous. There was no paralysis, paresis or spasm, in fact, no objective symptom other than stupor. Examination on February 3 showed the head to be drawn over to the right side and flexed, and the right upper extremity partly flexed at both joints. There was a peculiar elastic resistance of the right upper extremity on extending it. Knee-jerks were absent. The plantar jerk on the right side was lively, but could not be elicited on the left side. The body temperature remained about normal, and the pulse varied from 68 to 90 and the respirations between 20 and 22. Dr. Collins's diagnosis was circumscribed non-purulent encephalitis, and because of the motor symptoms on the right side it was thought to be in the left cerebral hemisphere. However, the lesion was found to be a focus of comparatively recent yellow softening situated on the right convexity, involving that portion of the first temporal convolution lying immediately below the supramarginal and angular gyri and separated from these by the Sylvian fissure. It involved the posterior arm of the internal capsule, and extended apparently into the extraventricular radiations emanating from the lower third of the posterior central gyrus. The internal capsule was not involved in its passage between the basal ganglia. No thrombus could be found. The special interest of the case lay in the fact that the motor symptoms were on the right side and the lesion was found on the same side.

## OBSTETRICAL SOCIETY OF PHILADELPHIA.

*Stated Meeting, April 2, 1903.*

The President, J. M. Fisher, M.D., in the Chair.

**Treatment of the Common Clinical Forms of Gonorrhea in the Female.**—This paper was read by Dr. R. Oliver Kevin, who deplored the fact that too little attention was given by physicians generally to the study of gonorrhea in the female and as a consequence the disease is comparatively seldom recognized until the woman has communicated the disease to others. The baneful effects of gonorrhea in the female were mentioned and asserted to be more serious than syphilis; as evidence of this were cited many cases of pus tubes, peritonitis, cystitis, abscesses, endometritis, etc., which occasioned much suffering and chronic invalidism. The point especially emphasized was the important rôle

played by the infection of Bartholin's glands in propagating the disease to the male and leading to apparently fresh infections in the woman herself; the cause of this is the extreme frequency of involvement of these glands which break down, forming small sinuses full of gonococci which will escape the observation of physicians unless pains are taken to critically examine the Bartholin glands in every woman presenting herself with symptoms of irritation or inflammation of the parts. The following is a classification as to structures involved: Urethra, cervix vagina, vulva, uterus, rectum and inguinal glands. If the uterus is the seat of an acute gonococcus infection local measures should be avoided owing to the danger of favoring the communication of the disease to the tubes, ovaries and peritoneum. In such cases the patient should be placed in bed and treated on general constitutional principles until the acute stage has subsided, after which injection of one-half ounce of 10 to 20-per-cent. solution of argyrol should be carefully made once daily. In involvement of the urethra, a 5 to 10-per-cent. solution of argyrol should be made 3 or 4 times daily, either by the physician or the patient. The writer stated that since adopting this plan of treatment no involvement of the bladder has been observed in his cases. Should, however, infection of the bladder exist, urinary antiseptics should be administered internally and the bladder be irrigated with weak solutions of silver nitrate, copper sulphate or potassium permanganate, after which one-half ounce of a 20-per-cent. solution of argyrol is injected in the bladder and allowed to remain. When the urethral follicles or Skene's glands are involved, the urethra should be dilated with ordinary sounds lubricated with Fenger's ointment, or, preferably, 20-per-cent. argyrol ointment in lanoline. In some cases the glands are best treated by injection (blunt-pointed hypodermic) with carbolic acid or silver nitrate 20 grains to the ounce.

In gonorrhea of the cervix the parts must be first cleansed of adherent secretions and a few drops of 20-per-cent. argyrol solution or 5-per-cent. protargol injection with a long-nozzled syringe, care being taken to previously expel all air from the syringe to avoid production of uterine colic. Treatment must be made daily. Tampons saturated with 20-per-cent. argyrol solution should be left in contact with the cervix for from 4 to 6 hours in order to obtain the continued gonococcidal effects of the drug.

When the uterus is involved, the organ should be irrigated with any of the following solutions: Creolin, lysol, normal salt solution, potassium permanganate, argyrol, protargol; or a mixture of carbolic acid, sulphocarbolate of zinc and glycerine. After irrigation a strip of gauze saturated with 20-per-cent. argyrol solution should be packed in the uterine cavity and allowed to remain. In some cases after subsidence of the acute stage the cervix and entire vaginal mucous membrane should be painted with silver nitrate solution 10 grains to the ounce. For the catarrhal process that remains no combination equals in efficiency a mixture of ichthyol 25 per cent., argyrol 25 per cent. and glycerin 50 per cent., used freely as a local application every day or two. Uterine curettement is dangerous when gonorrhea exists.

The author summarized his paper as follows: Always make a thorough examination of the region of Bartholin's glands in suspected cases. If these are infected, flush the vagina with antiseptic solutions, make free incision in the sinuses and glands, remove diseased or necrosed tissue with a curette, and swab the entire surface with 50-per-cent. argyrol solution, strong carbolic acid, or nitrate of silver. Argyrol is to be preferred because it is non-irritating and possesses deep penetrative power. Never use local treatment in an acute gonorrhea of the uterus, but put the patient at absolute rest and endeavor thereby to prevent the spread of the disease to the uterine adnexa and peritoneum.

Dr. Maier said he had enjoyed Dr. Kevin's paper very much; although his intra-uterine method of treatment at times startled him. It is in this class of cases that one must proceed with exceeding care or be liable to bring about an exacerbation of the disease. He thinks the tendency of the gonococcic infection is to remain more superficial, the micro-organisms lying in and between the epithelial cells. For this reason the object of their treatment should be to bring about a thorough desquamation of the superficial tissues. Ichthyol lends itself very favorably to this. Lately he had been using a 50-per-cent. formalin solution with marked benefit.

Dr. Oliver Hopkinson said he would like to ask Dr. Kevin what salts of silver he uses, and which he prefers under certain conditions. He has not found much difference in the use of protargol from that of the old nitrate of silver. He would like to know whether Dr. Kevin has found these new salts superior as applications to the old silver salts.

Dr. W. S. Stewart remarked that he had a little experience with gonorrhoea in various forms, particularly in males. His largest experience was during his service in the Civil War. He found his results were very much better when he began with mild treatment. The inflammation resulting from strong caustics was more terrible than the original disease.

Dr. John C. DaCosta said that the younger Gross, who was most successful in treating these cases, used continually to urge common sense in treating them; and himself used a great deal of common sense in his methods. In the primary inflammatory stage he used the mildest possible remedies. Dr. DaCosta has not much confidence in the new salts, believing them to be the preparations of manufacturers who are interested in pushing them. Some possibly use them on the principle of the old doctor's advice to his son: "My son, use new remedies while they are fashionable and while they cure." In the chronic cases he uses the old-fashioned nitrate of silver in solution of not less than 60 grains to the ounce, following the application sometimes by salt solution and finds that one, or sometimes two, applications often cure an old chronic gonorrhea.

Dr. Kevin in closing, said that swabbing out the uterus will not cure if the gonorrhea is not located there. Gonorrhea vaginitis is very rare. He has seen it but a few times in his life. He has had no experience in the use of formalin. Menge reports success with it in chronic cases. Dr. Kevin was afraid to use it in office practice, and if employed in the uterus he would advise that the cervix be first dilated to give good drainage. In chronic cases he has found the use of argyrol and protargol satisfactory, also nitrate of silver, although it is not as penetrating as the silver salts protargol and argyrol. He has had good results from them all used in the cervix. His experience has been that if he was not able to get rid of the purulent tenacious drop at the cervical mouth to go into the uterus with the old-fashioned treatment of tincture of iodine and carbolic acid, when the character of the discharge would soon change for the better and lose its mucopurulent appearance.

**The Electrothermic Angiotribe in the Removal of a Large Suppurative Tubo-ovarian Mass with Resection of Four Inches of Colon and End-to-End Anastomosis.**—This was the subject of Dr. A. J. Downes, of Philadelphia, in which he reported a case of suppurative tubo-ovarian disease forming a mass that completely filled the left side of the pelvis with dense adhesions to surrounding structures including a portion of the descending colon, which after being freed from its surroundings presented a thick, wide pedicle, closely as-

sociated with the uterus. In order to remove this with the least possible danger of contaminating the field of operation by escaping pus the electrothermic angiotribe was applied close to the side of the uterus for forty seconds. Upon removing the mass by section on the outer side of the thermic blade and releasing the instrument it was observed that the stump left by the operation was a well-cooked, and, therefore, sterile, non-oozing ribbon of tissue closely hugging the uterus. The colon stripped of its mesentery and partially denuded of peritoneum to the length of four inches was resected as follows: The bowel was clamped by his three-eighth-inch angiotribe at either extremity of the denuded area and the current turned into the blades for fifty seconds. After removing the blades section was made through the middle line of the ribbons thus formed. With the ends of the bowel thus occluded anastomosis was performed by a triple layer of continuous chromicized catgut sutures without sight of, or contact with, the mucous membrane. With the little finger the bowel was now invaginated at some distance from either side of the site of the operation with a view of breaking through the ribbons and thus re-establishing the caliber of the canal. Gas escaping from one section into the other proved the success of this manipulation. Five actively bleeding points, deep in the pelvis, were controlled by grasping them with the tips of straight forceps heated with his so-called electrotherm. Two heavy bands of torn omentum were hemostased by a one-fourth-inch blade thermic angiotribe in twenty seconds. The abdomen was closed without drainage. On the fifth day the patient had three natural bowel movements. Her recovery thus far has been uninterrupted.

Dr. J. M. Fisher said, in the discussion, that upon Dr. Downes' departure for Europe the patient was left in his charge and it is now twelve days since the operation. There has been an aseptic convalescence from the beginning, and the bowels are moved daily. As indicated in the paper, he assisted Dr. Downes in the operation. The patient presented complications that proved of especial value in the demonstration of the practical utility of his apparatus. The mass removed was closely associated with the uterus, enveloped by densely adherent omentum and the lower portion of the colon, it was firmly bound to the rectum and floor of the pelvis and was enucleated with considerable difficulty. Had the ordinary method of hemostasis been employed the close proximity of the mass to the uterus would have required ligation of the wide pedicle in sections and an incision of the parts through pus-degenerated areas. With this instrument, however, the whole width of the pedicle was grasped, the electric current was applied to the blades for forty seconds, and the whole mass was removed within less than a minute, leaving a well-cooked, sterile, and non-oozing stump that was closely hugging the uterus without a drop of escaping pus to contaminate the field of operation. To him the resection of the colon was a revelation. The intestine partially denuded of peritoneum and stripped of its mesentery to the length of at least four inches, certainly was sufficient to demand resection of this portion of the gut. In doing this he grasped the ends of the section to be removed with the angiotribe and by pressure and the electrothermic method hermetically sealed the lumen of the gut. Cutting through the middle line of the dessicated ribbons thus formed after releasing the instrument, not alone left the ends to be reunited, sealed and sterile, but the closed cooked ends of the portion of gut removed likewise rendered this a negative factor as a possible source of infection. The cooked ribbons of the bowel within the abdomen were now placed one upon the other and the anastomosis effected as described. He now invaginated the intestine from either side of the line of suture and broke through the agglutinated structures and thus re-established the continuity of the canal. At no stage of the operation was it possible for either fecal matter or gas to escape, in fact no portion of the intestinal mucosa was exposed to view. Taken all in all, Dr. Fisher says it was the neatest, and aseptically considered, the cleanest and most perfect piece of bowel surgery he had ever witnessed. He cannot conceive how one could do an intestinal resection with greater safety than by this particular method. Anastomosis was made in much less time and just as effectively as if it had been done by any one of the commonly recognized procedures, minus the possibility of infection from exposure of the lumen of the gut. Recently he read a report of Dr. Keefe, surgeon to one of the hospitals in Providence, R. I., who has done a number of resections with the Downes instrument upon dogs, and in no instance did he consider it necessary to separate the agglutinated ends before closing the abdomen, the continuity of the canal in every case becoming re-established within a few days by sloughing of the inverted ends. The pathological report upon the specimen removed by Dr. Downes has not yet been received. Dr. Fisher believes it to be a suppurating ovarian fibroma.

Dr. Kevin said that he saw Dr. Downes operate on a varicocele by his method with the angiotribe; there followed no complication or stitch abscess and the case recovered more rapidly than is usual in the ordinary open operation. Personally he thinks he would feel more secure in an abdominal operation on himself, to have a good stout ligature on a bleeding abdominal vessel. He also saw Dr. Downes remove the sac of a hydrocele and there was no sloughing or secondary infection, while the recovery was more rapid than usual.

Dr. Nassau said he had seen Dr. Downes use the forceps but once. That was before he developed the angiotribe. Personally he knows nothing of the use of the instrument. It seemed to him that the sealing over temporarily of the ends of the bowel is a very questionable method. In doing end-to-end suture of the intestine it is an important question whether it is not better to put the sutures through the entire coat of the bowel, as suggested by Connell, and tie the last stitch inside, and whether it does not make a better and safer union. He has used that method in one gastro-enterostotomy and been perfectly satisfied regarding the line of union between the intestine and the stomach. The patient, however, died from hemorrhage. If this method of Dr. Downes were used to make end-to-end suture it would be impossible to tie our sutures in the bowel. The Lembert suture does not hold a very great amount of tissue, and unless one is certain to pick up the submucous coat in the suture, one might as well not sew it at all. He believes some of the gentlemen who have studied the question of intestinal anastomosis would think it safer and better to sew the mucous membrane separately, making a row of approximal sutures and over all a line of sealing sutures. If the peritoneum is going to take care of the pus from pus tubes he thinks there is no need to fear a slight amount of infection from the bowel contents during anastomosis. This danger of infection can be eliminated by packing off. He would only be afraid to trust the peritoneum in the appendix cases, though Dr. Morris, of New York, has claimed such nice results. He has seen other gentlemen operate in the same way with great success. In one patient who left the hospital last week a considerable amount of pus was spilled, but the wound was disinfected and closed without drainage. There was little pain, no fever and no suppuration. In a second case the appendix was so plastered over with lymph that dissection was difficult. When it was stripped loose and the adhesions broken up the wound was disinfected, the abdomen closed and

the progress was satisfactory. If in such cases one can take care of infection, why should a method be used that might possibly give insecure stitching and in which there is difficulty in applying the mesenteric portion of the stitch.

Dr. Franklin said that he had seen Dr. Downes operate eight or nine times and had seen the cases afterward and known that the cures were perfect. He seemed to get better results in the inflammatory and pus cases by the use of his forceps than by the ordinary ligature operation. Whether this is due to the fact that he can remove more infected tissue, or that he leaves less raw surface after operation, Dr. Franklin does not know. He has no trouble in controlling hemorrhage. His present method with the angiotribe is much to be preferred to the one used several months ago.

Dr. Maier desired, through Dr. Fisher, to extend his congratulations to Dr. Downes. He had only seen the electrothermic cautery used once. He decided at that time that it was the ideal method of dealing with a pedunculated mass. He wondered how he would proceed in just such a condition as presented by the paper this evening. From the paper and Dr. Fisher's description he thinks he has overcome the difficulty of sessile attachment. There is remaining one other class of cases which he would like to see Dr. Downes deal with; it is those inflammatory conditions in which the structures are so friable that it is only after the most arduous and painstaking care that one is able to control the hemorrhage. If Dr. Downes is able to dessicate this tissue, and thus rapidly stop the bleeding, Dr. Maier will confess it to be, in his judgment, the ideal method. Concerning the bowel surgery, it takes time, and some handling of the ends of the intestines to introduce Lembert sutures; and he confesses he would feel safer with the forceps. There is some difference in a pedicle sealed and dropped back into the pelvic cavity, and the end of a gut temporarily sealed and subject to the subsequent handling required to introduce sutures.

Dr. Fisher, in closing the discussion of Dr. Downes' paper, said he was convinced that the electrothermic angiotribe is one of the coming things in surgery. Dr. Downes has a well-perfected instrument, and does good work. The mass in this particular case could not have been removed with the ligature without the extravasation of pus, but with the use of this instrument it was removed without the escape of anything to contaminate the field. Time is an element in abdominal surgery. The thick, wide pedicle to which he applied the whole length of the blades was thoroughly cooked within forty seconds and the mass removed; and the stump that was left was necessarily aseptic, and from the homogeneous appearance of the compressed structure he felt confident that there was no danger of hemorrhage. As indicated by Dr. Nassau, he has improved his instrument very materially in the last few months, and has combined the principle of the angiotribe with that of the cooking process first introduced by Dr. Skene. Dr. Skene's instrument was cumbersome; it could not be boiled; the blades could not be kept cool while in use; and three to four minutes were required to cook the structures. As already indicated, Dr. Keefe has done a number of operations with the Downes apparatus with uniform success and those upon the intestines of dogs are worthy of especial consideration by surgeons, and should prove of some interest to the friends of antivivisection. Even though the peritoneum, as has been suggested, will at times tolerate and dispose of small quantities of pus and fecal matter it is a danger to be avoided nevertheless; the object of all in abdominal work is to attain as near as possible the ideal, aseptically. If an intestinal anastomosis can be done without difficulty and without exposing the lining membrane of the bowel, and within one-quarter of the time usually expended in such work, he thinks it a common-sense proposition for us to adopt the plan that offers these advantages. It is interesting to note that those who have gained sufficient familiarity with the use of the instrument consider it indispensable in their work. The objection has been urged that owing to the absence of the electric current in private houses the use of the instrument is necessarily limited; in answering this we might say that abdominal operations at this advanced day are usually performed in hospitals, and of these but few, even in the smaller towns, are unprovided with an electric outfit to secure the necessary current.

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## PHILADELPHIA ACADEMY OF SURGERY.

*Stated Meeting, held May 11, 1903.*

The President, Richard H. Harte, M.D., in the Chair.

**Operations Upon the Stomach and First Portion of the Duodenum.**—This paper was read by Dr. William J. Mayo, of Rochester, Minn., in which he reviewed 303 operations, 286 of which were taken from the records of St. Mary's Hospital, Rochester, Minn., and 17 from the Minnesota State Hospital for the Insane at Rochester and St. Peter. The average age of the patients was forty-two years, 42 per cent. being males and 58 per cent. females. There were 26 cases of duodenal ulcer with two deaths. Lesions in the first portion of the duodenum cannot be easily differentiated from lesions in the stomach, which are due to the same causes. He divided lesions in the first portion of the duodenum into two groups, first, those caused by ulcer; and, second, those associated with gall-bladder disease. Of the ulcers limited to the duodenum, there was 1 acute perforating, 2 chronic perforating, 5 active and 3 cicatricial contractions with obstructive symptoms. Two deaths occurred, one from pneumonia and the other from exhaustion following gastro-enterostomy. Several of the cases could not be distinguished from gall-stones until the operation, which was begun for that purpose, and which condition was frequently associated with it. In three cases the gall-bladder was completely separated functionally from the bile tract: in four cases there were crippling adhesions to the gall-bladder, but without stone or cholecystitis, requiring dissection to loosen. The differentiating features in these cases were good appetite, delayed pain, general absence of vomiting, and only in one case, and in that on only one occasion was there hematemesis. The author expressed the opinion that surgical disease of the duodenum was much more frequent than has been supposed.

**Diseases of the Stomach.**—He divided these into two classes: (1) Gastric ulcer and associated causes of serious disturbance; (2) Cancer of the stomach. Out of the 303 cases reported in this paper 277 involved the stomach, with 28 deaths, or 10.1 per cent., 168 of these cases were in the benign group, with 11 deaths. These cases included all the non-malignant obstructions or conditions calling for operation for gastric pain, with or without acute exacerbation. In the majority of the cases the perverted stomach secretions seemed to be the most important cause, which is shown by the almost constant association of excessive secretions with gastric ulcer. Also in that part of the duodenum not protected by alkaline juices the same ulcers have also occurred after jejunostomy has been performed for the purpose of drainage. Drainage to relieve the excessive amount of secretion and thus produce healing of the ulcer is of great importance.

The following classification of gastric ulcer was made: (1) Round ulcer, (*a*) acute; (*b*) chronic. They

have the definite feature that there is but little thickening about the base of the ulcer; (2) Mucous erosions, a condition which must be accepted with caution; (3) Chronic ulcer with thickened base and usually irregular in form; (4) Benign obstruction without regard to cause, although usually of benign origin.

The last two classes are the ones which most frequently call for operation, chronic ulcer being usually found in adults and is more frequent in females. Spasm of the pylorus was thought to be one of the most important causes of the retention of excessive gastric secretion. There were 109 cases of cancer of the stomach, with 17 deaths, or 15.6 per cent. Late diagnosis and cachexia makes the report of this group rather discouraging, most of the operations were of a palliative character. Early exploratory incision in suspected cases was recommended, and all the vascular and lymphatic connections with the diseased area should be removed. He then gave a full description of the method he employed in doing the operation. The period without recurrence after the operation has been varied, one case having gone two years and another three years and six months. He then discussed the three methods of improving stomach drainage, *i.e.*, pyloroplasty; gastro-enterostomy and gastroduodenostomy.

**Difficulty of Diagnosis.**—Dr. Albert Vander Veer, of Albany, N. Y., referred to the difficulty of diagnosing conditions in the lower third of the stomach and the upper third of the duodenum, referring to two cases in which he thought he had to deal with gastric ulcer, in which operation proved it to be duodenal ulcer. In cases where all the symptoms seemed to point very strongly to an ulcer in the stomach and none was revealed upon opening the organ, he believed it could sometimes be discovered by lifting out the organ and holding it up to the light. The difficulty of differentiating between carcinoma and ulcer, when the growth occured in the posterior wall of the stomach was commented upon; gastro-enterostomy was thought to be the preferable operation for such conditions. He felt that many of the cases were left too long solely under the treatment of the medical man, and that if the clinical history and examination of the patient do not reveal clearly the conditions present, recommended exploratory operation. If possible, the complete operation should be done, but if the condition of the patient is such as to contra-indicate this, much relief can be obtained by a gastro-enterostomy. In regard to shortening of the ligaments for their treatment of gastroptosis, while he had had very little experience with this method, he felt that better results would be obtained by gastro-enterostomy with the establishment of good drainage. In regard to the pyloroplastic operation, he stated that he had in some instances gotten very good results and in other instances the symptoms recurred, which he thought was probably due to the fact that the operation was too high up, and attributed Dr. Finney's success with this method to the fact that he made the outlet lower down.

**Gastro-enterostomy Instead of Pyloroplasty.**—Dr. B. G. A. Moynihan, of Leeds, England, felt that the operation of pyloroplasty could be practically abandoned, he having done the operation three times, and in only one of the three cases did it prove satisfactory, in the third case a gastro-enterostomy being performed three or four months after the original operation. He did not feel that the operation was in any particular as satisfactory as the operation of gastro-enterostomy, stating that he had operated upon 75 cases by the latter method with only one death. He stated that he had not used the Murphy button in the last 65 cases, as he believed the simple suture was preferable, but stated that in the employment of the Murphy button in the first of his cases, he had noticed that it destroyed a considerable portion of the mucous membrane around the union which he considered of very great importance, and which he had been doing in all his operations. By the method which he has employed the section of the stomach and the section of the jejunum where the anastomosis is to be made are each grasped in a pair of forceps and brought outside of the abdomen, and the continuous suture applied. In regard to malignant disease of the stomach he believed that the infection took place principally through the lymphatic system, and in the operation therefor, he believed that first the greater curvature and then the lesser curvature should be removed. In regard to duodenal ulcer he believed that there were but very few cases in which this was a primary condition, feeling that in the majority of cases there had been a precedent gastric ulcer. Gastric ulcer is so frequently multiple that he did not believe excision thereof to be practicable, as future trouble may result from a remaining undiscovered ulcer, and searching for the ulcer materially affects the operation of gastro-enterostomy.

**Early Operation Imperative.**—Dr. J. B. Murphy, of Chicago, referred to the fact that the great majority of all cases of carcinoma occur in the pyloric end of the stomach, and as the first set of glands becomes involved by gravity are the lymphatic glands, any operation which is expected to produce permanent results must look to the removal of these glands, early operation being imperative. He further referred to the fact that about 10 per cent. of all cases of gastric carcinoma occurred in the cardiac end of the stomach and are practically unamenable to treatment. He referred to the fact that the surgeon usually sees the cases of gastric disease in the following numerical order: (1) Gastric carcinoma, (2) gastric ulcer, (3) pyloric stenosis, and (4) pyloric retention. As the gastric carcinoma is usually a sequence of the other conditions, he felt that in order to obtain the best results by operative treatment, the order in which these cases were seen should be the reverse. He believed that in order for the operation of pylorectomy, to attain the best possible results, it was necessary that it should be done early. He referred to the fact that the cases of gastroptosis are treated erroneously by the medical man by washing out the stomach and reducing the amount of food, on the theory that the condition is due to a weakening of the wall of the stomach, whereas, as has been definitely demonstrated by Dr. Mayo, it is due to a mechanical condition at the pylorus. He felt that the all-important factor in the operation was to secure permanent drainage of the most dependent portion of the stomach, and the only operation which had been used a sufficient length of time to justify the statement that it was the best, he felt, was gastro-enterostomy. He felt that if pyloroplasty was going to be of benefit to the patients it must be done early, in order to avoid ulceration and changes in the gastric secretions which lead on to malignant disease. He also expressed the opinion that so soon as it became demonstrated to the physician that surgical operations were safe and afforded great relief, the cases should be sent to the surgeon much earlier.

Dr. J. M. T. Finney, of Baltimore, Md., confined his remarks to the consideration of the question of pyloric stenosis of benign origin, and believed that the main question was thorough drainage, and any method that would produce this result he felt would be satisfactory. He referred to the fact that the advocates of gastro-enterostomy were far in excess of those who recommended pyloroplasty at the present time, which he believed to be due largely to the fact that the operation had not been properly performed. He felt that much better results could be obtained by the conjunctive work of the physician and surgeon in these cases, not necessarily with a view to immediate operation, but for the purpose

of ascertaining the exact conditions present. He advocated early exploratory operation under cocaine. He felt that pyloroplasty was preferable to gastrojejunostomy from the fact that it makes the pylorus in a more normal position. The mortality in pylorectomy he felt was too high to justify its employment except in cases of pyloric cancer. He stated that he had employed the method as described by Hartman in eight case of pyloric cancer, each of which made good recoveries and lived varying lengths of time. Owing to the nature of the growth, however, and the necessary involvement of the lymphatic structures, he felt that it was practically impossible to eradicate entirely the cancerous growth, and that recurrence would take place in a great many instances, for which reason he felt that the method advocated by Dr. Mayo, of direct anastomosis of the lower end of the stomach to the duodenum would probably produce the best results. He felt that the operation of gastro-enterostomy had not been followed in all cases by the results claimed for it by some of the previous speakers, among the untoward effects frequently noted being the vicious circle and symptoms of pyloric obstruction due to the fact that the outlet was made too high up in the stomach.

Dr. J. Chalmers DaCosta commended the Academy on their good fortune in having had the opportunity of listening to such great workers in this line as Drs. Mayo, Vander Veer, Moynihan, Murphy, Finney, and Mikulicz-Radecki, and his appreciation of their courtesy in having participated in the papers and the discussions.

## BOOK REVIEWS.

ANATOMY OF THE BRAIN AND SPINAL CORD. WITH SPECIAL REFERENCE TO THE GROUPING AND CHANGING OF NEURONS INTO CONDUCTION PATHS. By HARRY E. SANTEE, M.D., Ph.D., Professor of Anatomy in the College of Physicians and Surgeons, University of Illinois; Professor of Anatomy in the Harvey Medical College, Chicago. Third edition. E. H. Colegrove, Chicago.

THE present volume is a convenient short description in 200 odd pages of the structure and anatomy of the nervous system. It is meant to serve the purpose of a laboratory manual and as such is to be commended very highly. As a text-book, however, for the general reader, it is of little service, being practically non-illustrated. For students, therefore, we can most heartily recommend it. For practitioners, however, unless they are actually doing dissections or have an accompanying atlas it will be found of secondary service only.

The author has compressed in very short compass a great deal of useful and well-ordered information. It, therefore, makes a very desirable small book of reference.

DISEASES OF THE STOMACH. By MAX EINHORN, M.D., Professor in Clinical Medicine at the New York Post-Graduate Medical School and Hospital; Visiting Physician to the German Dispensary. Third revised edition. William Wood & Company, New York.

AS AN authority on stomach diseases and as an ingenious inventor of diagnostic implements, Professor Einhorn is known the world over; it therefore is not surprising to find his book a practical and suggestive treatise on stomach affections. Rather too much space has been devoted to detailed descriptions of gastric sprays, stomach buckets, esophagoscopes and other instruments, yet the author, without sacrifice of clearness, has succeeded in keeping the book of reasonable size.

Besides the usual chapters on anatomy, physiology, diet, methods of examination, etc., the author divides the book into sections on Organic Diseases with constant lesions, Functional Diseases with variable lesions, abnormal size, shape and position, Nervous Affections, and Condition of Stomach in diseases of other organs. A valuable description is that of enteroptosis or Glénard's disease. We would suggest that such diseases as "Gastrosuccorrhea continua periodica," "Achylia gastrica," and "Ischochymia" be referred to by their English names; as we prefer "cancer of the stomach" to "carcinoma ventriculi."

No mention is made of Pawlow's valuable work on the digestive glands, nor of much recent work which is still the subject of controversy, though the numerous references show a wide range of reading.

A TEXT-BOOK OF LEGAL MEDICINE AND TOXICOLOGY. Edited by FREDERICK PETERSON, M.D., President of the New York Sate Commission in Lunacy, and WALTER S. HAINES, M.D., Professor of Chemistry, Pharmacy, and Toxicology in Rush Medical College. In two volumes. Vol. I. W. B. Saunders & Co., New York, Philadelphia, and London.

THIS first volume of Peterson and Haines Legal Text-Book comes at a time when works of this class are very much in demand. There has been nothing authoritative published in this country on this subject of recent years that is in any sense of the word up-to-date and modern, and the present volume, therefore, fits a need that is real and pressing. It not only fits a need from the standpoint of timeliness, but also sets a standard of what a text-book on toxicology and legal medicine should be.

It is a very large work, even if this first volume alone is taken into consideration and the chapters are all of practical interest to all types of medical men, not only neurologists and alienists but the general practitioner, surgeons and anyone having to do with the care or treatment of the sick.

From the illustrative point of view, the work is an exemplary one and we know of no other work along these lines that is more deserving of high commendation than the present one and we await the second volume dealing with toxicology with interest, trusting to be able to make a full analysis of the entire work on its appearance.

BACTERIA IN MILK AND ITS PRODUCTS. By H. R. CONN, Ph.D., Wesleyan University. P. Blakiston's Son & Co., Philadelphia.

NO MORE significant chapter in the history of modern science can be found than that dealing with the relationship of bacteria to agricultural processes, and in no single one of these processes is the story complete and more interesting than that dealing with dairying. In fact, successful dairying at the present time depends to a very large extent upon skill in handling bacteria, and no scientific cheese maker or butter manufacturer can meet the present conditions of supply in this and other enlightened communities without a knowledge of these microscopical organisms. Therefore, in every school of dairying and in every agricultural college, the study of bacteria has become a necessary part of the curriculum.

The present volume is intended to meet just this want. It is a short, popular and yet complete description of the various bacteria which are found in milk and a thorough discussion of the relationship of changes wrought in milk and milk products by bacterial enzymatic action.

It is written in the author's well-known and commendable style and is a book that can be read to advantage

by every physician, both in the city and in the country, since a knowledge of the changes that take place in milk are so essential in dietetics.

Physical Chemistry for Physicians and Biologists. By Dr. Ernst Cohen. Translated by Martin H. Fischer, M.D., Instructor in Physiology in the University of California. Henry Hall & Co.

The developments of modern chemistry have, during the last decade been very markedly influenced by the teachings of Nernst and Ostwald, pioneers in the study of physical chemistry. Indeed so extensive have been the additions made, the alterations brought about and the new vantage points gained by this young science that the biological sciences have in their turn come under its sway. Indeed the science of physical chemistry has been necessary to explain many of the indirect life phenomena, so far as any theories, non-vitalistic or otherwise, can ever explain such phenomena.

The present series of lectures make a very excellent introduction to the study of physical chemistry and it can be most heartily commended to the medical profession.

There is, perhaps, a little too much mathematics for the average man, but mathematics are unfortunately essential to the understanding of molecular physics. The mathematics, however, in the present volume have been reduced to a minimum, making it one of the most serviceable of recent additions to this growing branch of science.

Bacteriology. A Manual for Students and Practitioners. By Fred. C. Zapffe, M.D., Professor of Pathology and Bacteriology in the Illinois Medical College; Professor of Histology in the Department of Medicine and in the School of Dentistry of the University of Illinois, Chicago. Series edited by Bern B. Gallaudet, M.D., Demonstrator of Anatomy and Instructor in Surgery, College of Physicians and Surgeons, Columbia University, New York; Visiting Surgeon, Bellevue Hospital, New York. Illustrated with 146 engravings and 7 colored plates. Lea Brothers & Co., Philadelphia and New York.

Another volume of Lea's Series of Pocket Textbooks has recently been published and fully maintains the high standard set by the previously appearing volumes of this convenient series. The book has been written especially to fulfill the needs of the student, all unnecessary scientific discussions having been excluded, but the general practitioner will find it a very handy reference book upon the subject, for it contains not only a full and comprehensive treatment of the subject itself but also particular attention has been given to its practical relation to medicine. The illustrations and plates are numerous and have evidently been prepared with considerable care, for they well serve the purpose of explanation and elucidation. The laboratory methods are given in sufficient detail to be of service to the student and the material is complete enough to serve the purpose of any class-room work.

System of Physiologic Therapeutics. Edited by S. S. Cohen, A.M., M.D. Vol. X. Pneumotherapy Including Ærotherapy and Inhalation Methods and Therapy. By Dr. P. L. Tissier, Assisting Consultant Physician to Laennec and Lariboisiere Hospital, Chief-of-Clinic in the Faculty of Medicine of the University of Paris. P. Blakiston's Son & Co., Philadelphia.

This is a further contribution to the System of Physiologic Therapeutics outlined by Dr. Cohen and the present volume makes a very worthy addition to the system. The work is divided into two parts, Part I on Ærotherapy and Part II on Inhalation Methods and Therapy. Air as a therapeutic agent had been utilized from very ancient times, but exactness in methods of limitation and clearly defined lines of therapy have been wanting until comparatively recent times.

The author here gives a short summary and then plunges into the physiological relations of the atmosphere, its position and character to respiration. This is all discussed in 36 pages, hence it can be readily seen that this therapeutical portion of it is compressed. Open-air treatment of tuberculosis naturally comes in for a large share of the author's descriptions.

Special chapters on artificial pneumotherapy, compressed air, both high atmospheric pressure, pneumatic chambers, etc., are well considered, the book being rich from the standpoint of procedure and apparatus particularly.

In Part II the various methods of inhalation by which air charged with medicinal substances is introduced into the air passages is considered at great length.

The book is an extremely practical one and whereas, in places, perhaps a trifle optimistic in its teachings concerning the value of the various methods employed, is one whose facts should be in the possession of every practitioner.

Progressive Medicine. A Quarterly Digest of Advances, Discoveries and Improvements in the Medical and Surgical Sciences. Edited by Dr. H. A. Hare and H. R. M. Landis. Vol. II, June, 1903. Lea Brothers & Co., New York and Philadelphia.

This present volume contains the report of progress on the surgery of the abdomen, advances in the field of gynecology, new researches on diseases of the blood, ductless glands, the hemorrhagic diseases and diseases of metabolism and an article on ophthalmology. These are contributed by Drs. W. B. Coley, John G. Clark, Alfred Stengel, and Edward Jackson.

The same high praise that it has been our privilege and pleasure to accord to Progressive Medicine in the past is its due in the present number. We have rarely seen so valuable a work that has kept its high standard for so long a time, and, from the evident mutual understanding of editor and contributors, there is little reason to believe that Progressive Medicine will ever sink into second rank, but will always remain a leader in this type of work.

## BOOKS RECEIVED.

*The* Medical News *acknowledges the receipt of the following new publications. Reviews of those possessing special interest for the readers of the* Medical News *will shortly appear.*

Surgical Asepsis. By Dr. H. B. Palmer. 8vo, 231 pages. Illustrated. F. A. Davis Co., Philadelphia.

A Text-Book of Chemistry. By Dr. E. C. Hill. 8vo, 523 pages. Illustrated. F. A. Davis Co., Philadelphia.

Studies in the Psychology of Sex. By Dr. Haverlock Ellis. 8vo, 266 pages. E. A. Davis Co., Philadelphia.

Progressive Medicine. Vol. II. June 1903. 8vo, 435 pages. Illustrated. Lea Brothers & Co., New York and Philadelphia.

Syphilis in Dentistry. By Drs. L. B. Baldwin and E. R. Larned. 8vo, 120 pages. Illustrated. E. H. Colegrove, Chicago.

Diseases of the Pancreas. By Dr. E. L. Opie. 8vo, 360 pages. Illustrated. J. B. Lippincott Co., Philadelphia and London.

# THE MEDICAL NEWS.

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## ORIGINAL ARTICLES.

### STUDIES ON THE ACTION OF ALCOHOL IN DISEASE, ESPECIALLY UPON THE CIRCULATION.*

BY RICHARD C. CABOT, M.D.,
of Boston, Mass.

PERHAPS no subject has been more frequently or more heatedly discussed during the last few years than the action and value of alcohol. We have had two interesting symposia upon the subject in Boston within a year, and many similar discussions are reported in domestic and foreign journals. One might think, therefore, that the subject was about threshed out and that nothing new could be said about it, but as one looks over the reports of these discussions one fact is very striking, and that is the scarcity of experimental evidence regarding the action of alcohol in diseased human beings.

In the discussions to which I have referred, the disputants have usually ranged themselves in two parties, those favoring the use of alcohol on one side and those opposed to its use on the other. Those who favor its use usually do so on the ground of their general impression that it has done good in cases under their observation. Those opposed to the use of alcohol usually refer to a number of experiments, for the most part not very recent ones, upon the action of the drug in the lower animals. But very rarely has any one anything to say about experiments or measurements of the action of the drug upon any of the functions of the diseased human being. The "advocates of alcohol" say that it does good, but if you ask them: *What* good does it do? Does it decrease temperature? Does it improve sleep? Does it slow or strengthen the heart's action, and if so how much?—they have rarely anything to answer. On the other hand, if you ask the "opponents of alcohol" what harm it does, they will point to the effect produced on a dog or a rabbit by doses of alcohol which would correspond to giving a man a quart of whisky at a drink, or they will refer you to experiments on healthy soldiers or typesetters. The use of such evidence assumes that alcohol acts in the same way in all animals, whereas we know well that its action in mammals is very different from its action in birds, and have by no means proved what is true of its action in dogs or rabbits is true of its use in man. Another common assumption is that the effects of alcohol in disease are similar to its effects in health. But this is a totally unproved assumption, and there is, I think, a good deal of evidence that it is not true.

It seems to me, therefore, that there is a real need for exact, experimental evidence regarding the action of alcohol in sickness, and it is to this problem that I have addressed myself. I have not sought to show that alcohol does good or that it does harm. I have rather tried to find out *what it does*, what its effect is upon temperature, upon the heart and pulse, upon the rapidity of the respiration, upon the amount of urine, upon the sweat, upon the appearance of the tongue, upon the appetite and upon the cerebral condition of the patient as shown in the amount he sleeps, in the effect of the drug upon delirium, and upon his spirits so far as could be ascertained by talking with him.

I will not deny that I have approached the subject with a marked bias, but I hasten to add that I have done all I could to prevent this bias from influencing my observations. That I have succeeded, at least to some extent, is evidenced, I think, by the fact that my results have not come out at all as I expected and indeed hoped that they would.

In order to counteract so far as possible the bad effects of my prejudices, I have recorded each of my observations on separate slips of paper without allowing myself to refer to the chart in which they were later recorded. As I could not retain in memory the records of the individual patients, and did not allow myself to be reminded of them by looking in the chart, I was thus unable to influence the readings in the direction of my expectations, as I previously found it very tempting to do.

In the study of the effects of alcohol on temperature, appetite, sleep, etc., I have circumvented my bias by getting nurses, who had no idea of what I had in mind, to record the data for me on blanks provided for the purpose.

I have said that there was a dearth of experimental evidence regarding the action of alcohol in diseased persons, but this lack is much more striking in certain directions than in others. Certain points have, I think, been pretty well cleared up, while others are still obscure. Hence it may not be out of place to sum up what may be regarded as relatively settled, in order that the unexplored regions may be made more evident by contrast.

About the food value and the digestive action of alcohol, about its effect on temperature, respiration, the secretions and the susceptibility of the lower animals to infection, there is a good deal that we may consider settled.

On the other hand, there are very few experiments upon its action on the *circulation* of the sick, or upon the protective powers of the human blood against infection.

These two problems, then, confront us:

(1) What effect has alcohol upon the circulation in sick persons?

* Read before the Association of American Physicians, May 13, 1903.

(2) What is its effect on the power of man's blood to protect his organism against infection?

The first of these two questions I have tried to answer in the present lecture. The second I hope to attack later.

Before presenting the results of my own experiments I will endeavor to summarize what seems to me established as the result of work previous to my own.

We may treat as established the following statements:

### I. ALCOHOL AND METABOLISM.

(1) In healthy persons alcohol is capable of replacing satisfactorily the fats and carbohydrates of ordinary food.

(2) It is not yet settled whether or not alcohol can replace the proteids of our customary diet.

(3) The food value of alcohol as a substitute for carbohydrates and fat is perfectly consistent with its toxic properties. It is beyond doubt both a food and a poison.

### II. THE ACTION OF ALCOHOL ON DIGESTION AND ABSORPTION.

(4) While it is in the stomach alcohol disturbs the digestive processes to a greater or less extent according to its concentration.

After absorption (either from the stomach or from the intestines) alcohol acts upon the stomach through the nervous system, and exerts a favorable influence both on its secretions and on its motility. But the nervous system is soon blunted to its influence, so that more and more is needed to influence digestion.

(5) On the intestinal absorption of food alcohol has no considerable influence so far as is known.

### III. ALCOHOL AND DIURESIS.

(6) In healthy persons and in renal or cardiac disease, alcohol has no considerable effect as a diuretic. The free diuresis often seen after beer drinking is due in part to the water ingested and in part to the $CO_2$ and other non-alcoholic constituents of the beer.

### IV. ALCOHOL AND DIAPHORESIS.

(7) The experimental data are not conclusive, and great individual differences exist, but the majority of experiments seem to show that alcohol diminishes sweating in healthy persons.

### V. ALCOHOL AND RESPIRATION.

(8) Practically all experiments show that under the influence of alcohol a larger volume of air passes through the lungs. This is especially marked in fatigued persons. There is, however, no increase in the amount of $O_2$ absorbed or in the amount of $CO_2$ given off.

The patient is made to do more work in breathing without getting any known benefit from it.

### ALCOHOL AND PULSE RATE.

Lichtenfels and Frohlich[1] found first a decrease, later an increase in pulse rate.

Tscheschichin[2] and Ruge[3] noted a very marked rise in pulse.

Zimmerberg[4] could find no variation from normal. Reiss got similar results.

Mertens[5] noted no change, Martins[6] a decrease, Jacobi,[7] Duchek,[8] Hemmeter[9] no increase.

In all the experiments in which subjects have been put into an unchanging environment and conditions, the changes in pulse before and after alcohol sink to a minimum.

Wendelstedt[10] took especial pains that the persons on whom he experimented should remain quiet some time before the beginning of the test and stay in just the same position after swallowing the alcohol. With these precautions the changes in pulse rate were trifling. For a few beats the pulse rate sometimes rose a little, but soon returned to normal. Occasionally there was a slight decrease in rate. The following data may be quoted.

N. K., healthy, fasting, horizontal position for two hours before the experiment.

| | | |
|---|---|---|
| I. | 9.30 A.M. | Pulse 54 |
| | 9.50 | " 56 |
| | 10.07 | Sherry, 300 c.c. (=10℥) |
| | 10.15 | Pulse 56 |
| | 10.40 | " 56 |
| | 11.05 | " 56 |
| II. | Same subject; same conditions. | |
| | 8.55 A.M. | Pulse 60 |
| | 9.15 | " 60 |
| | 9.30 | Brandy, 100 c.c. (3½℥) |
| | 9.40 | Pulse 57 |
| | 10.00 | " 58 |
| | 10.20 | " 58 |
| | 10.40 | " 55 |
| | 11.00 | " 60 |

III. Same subject after a hard day's work, and one-half hour in horizontal position.

| | |
|---|---|
| 6.40 P.M. | Pulse 64 |
| 6.55 | Absolute alcohol ℥ ii diluted |
| 7.05 | Pulse 64 (subject drunk) |
| 7.28 | " 64 |
| 7.55 | " 68 |
| 8.15 | " 64 (less drunk) |
| 8.35 | " 68 |

To the finger the pulse after alcohol feels fuller and stronger, and the sphygmograph shows a tracting like the "pulsus celer" of aortic regurgitation.

### BLOOD PRESSURE AFTER ALCOHOL.

Zimmerberg[11] found after putting alcohol into a cat's stomach a marked fall in blood pressure.

Gutnikow[12] experimented on curarized dogs, into whose stomachs he introduced 250 c.c. of 50 per cent. alcohol. The result was a considerable fall in blood pressure together with a dilatation of the small arteries, capillaries, especially in the territory of the splanchnic.

The dog here used was so small (20 kilos), and the dose so enormous, that no inferences ought to be made from these experiments as to the effect of moderate doses in man.

Weissenfeld[13] reports work done in Binz's laboratory. The experiments were carried out on men with the help of v. Basch's sphygmoma-

nometer. After 2 or 3 oz. of sherry the pulse rose in three cases from 15 to 30 mm. Hg.; in one even as much as 60 m.m. Hg.

Passler[14] and Schule.[15] working with Gaertner's tonometer on a healthy man, recorded a fall from 110 to 95 mm. Hg. twenty minutes after sherry and brandy. An hour later the pressure was 115 again.

Rosenfeld[16] worked with dogs, connecting the femoral artery with a mercury manometer. He was careful to avoid the common mistakes of overdosage and overconcentration in the alcoholic solutions used, which were of 10 to 25 per cent. strength, and introduced by a tube into the dog's stomach.

The question whether dogs tolerate alcohol better than men seems to be answered in part by the following facts:

(1) It takes the same dose *per kilo* to narcotize an average man or an average dog.

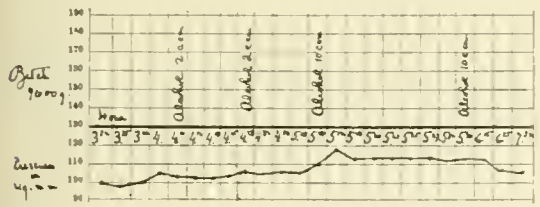


CHART I.—Blood pressures in dogs after alcohol. (Rosenfeld.)

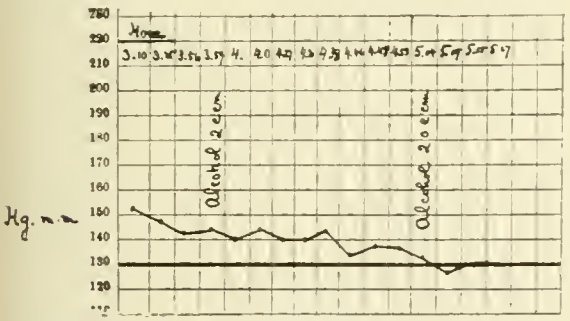


CHART II.—Blood pressures in dogs after alcohol. (Rosenfeld.)

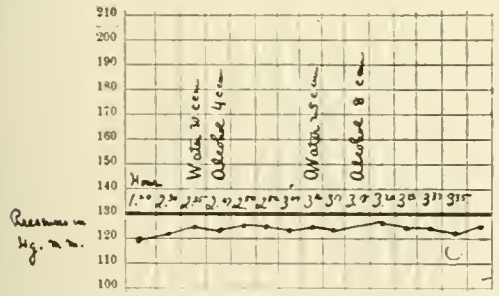


CHART III.—Blood pressure in dog after alcohol.

(2) It takes approximately the same dose *per kilo* to kill a man or a dog.

But to make sure that he did not err on the side of too small dosage Rosenfeld increased his doses from the equivalent of ℥i of whisky at a time up to the equivalent of ℥x of whisky.[17]

The upshot of his 300 or more measurements in 8 dogs was that alcohol has no appreciable effect upon the dog's blood pressure. He used fresh dogs with high blood pressure (152 mm. Hg.), tired dogs with low pressure (82 mm. Hg.) and dogs with pressures intermediate.

The result was the same in all cases. Variations in the pressure from hour to hour were no greater than occurred spontaneously, that is, when no alcohol was given.

### ALCOHOL AND TEMPERATURE.

In states of profound intoxication, belonging practically to the class of collapse states, there may be a very marked lowering of temperature. Experimentally Rosenfeld produced readings of 88.7 F. in dogs.

Therapeutic doses of alcohol given to sound men seemed to produce a slight lowering, amounting, according to the experiments of Binz's pupils, to about .7° F. In sick people the decrease was about the same. The temperature of the skin is greater than that of the rectum, a fact which seems to indicate that the lowering of the rectal temperature and presumably of that of the internal organs in general is due to the dilatation of the cutaneous vessels.

Dumouly[18] found that no effect was produced in fever patients by doses of less than 20 gm. of absolute alcohol (= about ℥iss of whisky).

### ALCOHOL AND THE NEUROMUSCULAR SYSTEM.

The most recent and careful researches on this much-disputed point seem to show that in fresh healthy men the power of voluntary muscular movement is increased about 7 per cent. for the first one-half hour, after which there is decrease to a point about 5 per cent. below the normal.

By diminishing the sense of fatigue, alcohol undoubtedly enables men to push themselves for a short time beyond the limit which nature would otherwise have imposed upon them through fatigue.

### ALCOHOL AND THE SUSCEPTIBILITY TO INFECTION.

Latinen found a decrease in the number of leucocytes in cases of pneumonia during alcoholic medication, and Massart and Bordet observed a negative chemotactic effect upon leucocyte even with very dilute solutions of alcohol.

That it increases in animals the susceptibility to infection and diminishes the animal's power of resistance has been shown so many times and in so many ways that it is not necessary to go over the evidence in detail.

In man something more or less akin to experimental evidence in this matter is furnished by the well-established fact that alcoholics are predisposed to infectious diseases, and have them in a very virulent form.

More direct and important evidence is furnished by researches designed to investigate the antitoxic power of the blood in health and in disease with and without alcohol.

Mircoli[19] compared the antitoxic power of normal human blood with that of alcoholics, by test-

ing the power of each to neutralize Maragliano's tuberculin. The blood of normal men was found to neutralize large doses of this toxin; for example, 10 c.c. of this tuberculin is a fatal dose for animals of 1 kilo weight. But this animal can be protected against this dose by the injection of 2 to 3 c.c. of normal human serum. The serum of chronic invalids, on the other hand, does not possess this power.

But the serum of drunkards was found to be much more more strongly antitoxic than that of normal men. In one case one-tenth of a c.c. of drunkard's serum was sufficient to protect a kilo animal against 10 c.c. of tuberculin. From these facts Mircoli concludes that alcohol is a most valuable remedy for tuberculosis, forgetting that tuberculin and tuberculosis are by no means the same, and that alcoholic cirrhosis and tuberculosis of the lungs or peritoneum are very frequently associated.

Nevertheless, Mircoli's results are of great interest both in themselves and as an indication of the direction in which future research should be turned.

More recently Abbott and Bergey[20] have undertaken a study of the blood reactions of normal and alcoholized rabbits by Ehrlich's methods. Their conclusions are: (1) The daily administration of alcohol per os to rabbits reduces the amount of hemolytic complement in their blood. (2) The diminished reactivating power of the blood of alcoholized rabbits is not due to the presence of small amounts of alcohol as such in the blood. (3) Alcohol not only reduces the amount of complement in the rabbit's blood, but may cause at the same time a reduction in the number of free specific receptors in the blood of a rabbit artificially immunized against an alien blood. (4) The diminished complement-content of the blood of alcoholized rabbits renders the animal more susceptible to the toxic action of an alien blood.

### TOLERANCE OF FEBRILE PATIENTS FOR ALCOHOL.

It must have forced itself upon the notice of any one who has watched the effects of alcohol in fever cases, that such patients will stand an extraordinary amount of the drug without any signs of intoxication.

For example, I recently watched a patient with typhoid in the service of Dr. F. C. Shattuck, who took for nearly a fortnight two ounces of whisky every hour, day and night, that is, three pints of whisky every twenty-four hours, without any sign of intoxication. In the same service a young girl also suffering from typhoid took 60 ounces of champagne; nearly two quarts every day for three weeks without any of the ordinary evidences of intoxication.

This certainly proves that alcohol acts differently in disease and in health, and makes it obvious that the results of experiments with alcohol on healthy men should not be supposed to prove what its effects in sickness may be.

But because alcohol acts *differently* in disease, are we obliged to suppose that it acts *more beneficially* than in health?

That we do not smell it in the breath of typhoid fever patients, despite a dosage which would make a well person reek with it, does not point to any considerable difference in the amount burned up in the body, for even in the intoxicated states produced by alcohol in healthy persons, 98 per cent. of the alcohol is burned in the body. The alcoholic odor in the breath does not prove that any considerable portion of the alcohol is being excreted through the lungs.

Alcohol given to dogs with sugar does not make them nearly as drunk as when it is given without sugar,[21] but its harmful effects are no less marked.

That sick persons are not intoxicated even by enormous doses of alcohol gives us no evidence whatever that it is doing good, nor on the other hand is it a reason for believing that it does harm. It is an interesting but a wholly neutral fact so far as the therapeutic value of alcohol is concerned, and is important chiefly as a warning to those who tend to argue directly from the known effects of the drug in health to its supposed effects in disease.

### THE PSYCHIC EFFECTS OF GIVING ALCOHOL.

(1) On the mind of the physician and of the patient's family or friends.

(2) On the mind of the patient himself.

(1) The virtues of alcohol as a stimulant have been so firmly established in the minds of the laity, that both the patient and his friends are apt to be comforted by the knowledge that it is being given. It does not sound exactly like a drug, its taste is generally not disliked, and the cheering impression that something is being done, and done pretty frequently, is diffused among those who are caring for the patient, and may reach the mind of the patient himself.

By a sort of auto-suggestion, a similar impression is sometimes produced upon the physician as well. It is very hard to sit still and do nothing for the patient, and when we have no very reasonable belief in the efficacy of a drug, it is a relief to the physician's mind to give *something*, especially something that is welcomed by the patient and his friends, and something of which the community generally has a high opinion. Then the soothing effect upon the patient, which the narcotic action of alcohol produces, is indirectly soothing to the physician as well, and increases his willingness to prescribe and to continue the so-called "stimulant." In short, alcohol makes physician, patient and friends more comfortable.

(2) The narcotic action of alcohol, its tranquilizing and benumbing effects upon the nervous system, have been very properly insisted on as a therapeutic influence of considerable importance by Cushny and by Meltzer in recent addresses on the use of alcohol in disease. To save the patient from worrying about himself, from broodings on the cause and apprehensions about the future of his disease is certainly to do him a service. But

we cannot, at the same time, praise alcohol for bringing the patient into so passive and vegetative a condition and expect also to take advantage of that active, fighting, determination to get well, which many physicians suppose to have a real effect in combating disease. Either the tranquillity or the actively resistant will-power of the patient must be sacrificed. Whether either factor has any genuine influence on the course and outcome of disease is entirely a matter of guess work. We have no definite knowledge in the matter, and all that I mean here to point out is, that if we are to maintain that the narcotic effect of alcohol is beneficial, we must give up the idea that the patient's will-power is an important factor in his recovery.

But although it is generally assumed that alcohol has a benumbing effect, and so a tranquilizing effect upon the patient, it has not been my experience that any such effect is always or even usually to be observed. That very striking *neutrality* of alcohol, which has been my chief lesson throughout all the other observations which I have made on its action, has impressed me and surprised me afresh in studying its psychic effect. Only in four out of the 69 cases in which I have watched for the tranquilizing effect of alcohol has any such effect been noticeable. In the vast majority of patients as I talked with them several times each day during a period of about six weeks, no change whatever in the prevailing mood could be determined. The down-hearted patients were not notably more or less down-hearted, the cheerful ones were neither more nor less cheerful. One patient in especial, in whom the dose of 60 ounces of champagne per twenty-four hours, was suddenly cut off, showed not the slightest psychical change that I could detect.

A few of the typhoid patients seemed to sleep a larger part of the day during the time when alcohol was given them, but it was difficult to be sure that this change would not have taken place spontaneously. In one patient who became more sleepy just after the alcohol was given him, the sleepiness continued just the same for the next ten days after the alcohol was withdrawn, in fact until the temperature became normal.

Very likely finer psychical tests, such as Kraepelin employed in his studies on typesetters, would have shown that, in disease as in health, the associations and reactions necessary for the more delicate psycho-motor processes are slowed by the action of the drug; but that any constant effect was produced on the temper, mood and spirits of the patient I could see no reason to believe.

### MEASUREMENTS OF BLOOD PRESSURE.

From this résumé will be seen that no considerable amount of work on the estimation of blood pressure in human beings during the administration of alcohol has so far been done. Rosenfeld's observations are, it seems to me, conclusive, so far as concerns the effect of the drug upon dogs, but we cannot immediately reason from its effect in healthy or in tired dogs to its effect in sick men. Accordingly, I have undertaken a series of measurements of the blood pressure before, during and after the administration of alcohol in patients for the most part sick with typhoid fever in the medical wards of the Massachusetts General Hospital. I am especially indebted for the opportunity to carry out these researches to the kindness of Drs. F. C. Shattuck and R. H. Fitz. My method of work has been the following:

Two instruments have been used: the Riva-Rocci machine for the estimation of the maximum or systolic pressure, and Oliver's hemodynamometer for the estimation of minimum or diastolic pressure. The working of these instruments may be explained in a few words.

The Riva-Rocci apparatus consists of a dilatable rubber armlet about three inches wide, covered with tough canvas as a support to the rubber, and arranged by means of a series of hooks and eyes so that it can be tightly fitted to arms of any size. By means of a V-tube air is blown simultaneously into this armlet and into the bulb of a mercury manometer. For inflation an ordinary cautery bulb was used.

To use the instrument we attach the armlet snugly around the patient's upper arm about two inches above the bend of the elbow, and force air into it until the radial pulse disappears. When the radial pulse is no longer felt, we note the point to which the mercury column has been forced up and record the reading in millimeters. The instrument appears to be very accurate in the sense that different observers after an equal amount of practice read practically the same independently, and that successive readings by the same observer in the same patient do not vary more than 3 or 4 mm. of mercury. It is very easy to use, and requires very little practice. It is not at all painful to the patient, as I have ascertained by many experiments upon my own arm, and no patient has complained of it in any way, although in some cases more than a dozen readings were taken in the course of a day. No bad effects upon the arm of the patient have occurred, although the cases selected were mostly typhoid, in which the thrombosis is well known to be favored. Any errors that there may be in the instrument may be disregarded in a series of comparative observations upon the same patient by the same observer, since the amount of error is presumably the same in all the measurements.

Oliver's hemodynamometer is a more difficult instrument to use. It consists essentially of a hollow rubber pad filled with glycerine and water which is put over the radial artery and through which the pulsations of the artery are transmitted to a rigid rod and thence through a ratchet and pinion adjustment to a needle moving upon a clock-face dial. By exerting pressure with the instrument through the pad upon the radial artery the needle is made to revolve and, by suitable pressure, the pulse may be obliterated. If, then, we relax the pressure upon the artery until a faint pulsation is permitted, this pulsation is represented by slight oscillations of the needle. As

we relax the pressure gradually more and more, the needle upon the face of the dial has a double motion. It moves backward toward the starting point (zero) and it also oscillates back and forth during its course. These oscillations gradually increase up to a maximum as we relax the pressure, after which if we relax it still more, the oscillations begin to diminish and gradually disappear as the needle approaches the zero of the scale. The maximum oscillations in normal persons occur between the points marked 100 and 130 on the scale. But the pressure within the fluid pad of the instrument is the same as that within the artery when its maximum oscillation is reached, and this corresponds, as Howell has shown, to the minimum or diastolic pressure. The fluid pad obviates the difficulties of applying the instrument over the uneven surface of the wrist. The soft and elastic surface of the pad adjusts itself among the structures of the wrist, and gets into contact with the artery at some point, provided the artery is palpable at all. The chief difficulties in using the instrument are (1) to hold it steady without increasing or decreasing the amount of pressure used upon the artery, and (2) to record accurately the position of the swiftly-moving needle. With well sustained pulses it is very easy to see just where the needle starts and where it ends in each of its excursions, but in the bounding pulses of febrile patients this is often very difficult. With a moderate amount of practice, however, different observers do not vary more than five points in the scale in their readings. My instrument reads about twenty-five Hg. too high. Accordingly I subtract twenty-five from each of its readings. This prevents their possessing absolute values, but leaves unchanged the *variations* from hour to hour, which is all that I attempt here to record (see charts).

With these two instruments we have made 1,169 measurements in 58 individuals. We began by taking observations every half hour to determine the amount of range of variation at short intervals. Later we took the measurements every hour and every two hours and finally every four hours as the variations in the smaller periods of time were insignificant, or were excited from moment to moment by occurrences, the mark of which would be as likely to escape detection in half hourly as in four hourly measurements. Thus a cry or groan from another patient in the ward, the approach of dinner or the answering of a question needing some thought would send the blood pressure up a number of points, the rise lasting only a few minutes.

We began our four hourly measurements on febrile patients recumbent in bed and upon unvarying diet. After two or three records with each instrument the patient was given either half an ounce of whisky or an equivalent amount of absolute alcohol properly diluted and flavored. This dose was repeated every four hours for the first twenty-four hours and then doubled and continued for twenty-four hours more. After that it was, in the majority of cases, omitted, although in a few it was continued several days more in order to ascertain whether any further effect was produced after the first forty-eight hours. After stopping the alcohol we continued our readings for at least twenty-four hours and often longer.

Among the cases studied were 25 of typhoid fever, 2 of pneumonia, 2 of chronic valvular heart disease, 2 of malignant endocarditis, 2 of gonorrheal arthritis and 1 each of the following: pleuritic effusion, Addison's disease, cirrhosis of the liver, thrombosis of a leg vein, tuberculosis peritonitis, myelitis and phthisis.

Summing up in a few words the total result of these many measurements: They indicate that in cases of the type studied, alcohol has no considerable effect either upon the heart's action or upon the tension of the peripheral vessels that can be measured by the instrument employed. I must confess that this result was a great surprise to me. Some effect, either for good or evil, some cardiac stimulation or some vascular relaxation I had certainly expected to see, but the result, like all those obtained in my investigations of the effects of alcohol on other functions of the body, was practically *nil*.

The following charts and tables give further details of the work:

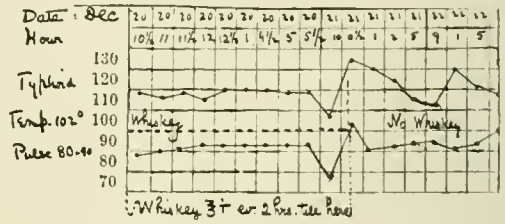


CHART IV.—Shows records of frequent pressure measurements in a case of typhoid with and without whisky.

## SUMMARY AND CONCLUSIONS.

(1) In 41 patients, mostly cases of typhoid fever, 1,105 measurements of the blood pressure were made before, during and after the administration of alcohol in therapeutic doses. Neither the maximum nor the minimum blood pressure showed any variations that could reasonably be referred to the action of the alcohol. So far as was determined by the methods and in the cases used in this research, the action of alcohol upon the circulation was *nil*.

(2) The same neutrality and apparent inertness of therapeutic doses of alcohol in relation to the temperature, pulse rate, respiration rate, appetite, sleep, delirium and secretions (renal and cutaneous) of 309 patients suffering from a great variety of diseases was the total impression derived from 2,160 observations in these cases.

(3) These observations are not interpreted as proving that alcohol is useless or useful in disease.

As a narcotic and vasodilator it may have an important place in therapeutics.

(4) More important probably than any of the questions investigated so far is the problem of the effect of alcohol upon the power of the sick man's blood to protect him against infection and other harmful influences. The studies of Abbott and of Mircoli have begun to clear a path in this direction, and we have a certain amount of evidence relative to a similar problem in the lower animals. But as the results of studies regarding the action of alcohol upon animals or upon healthy men cannot be used as evidence of its action in sick men, there is a good field for experimental work in this direction along the lines of Ehrlich's newer methods.

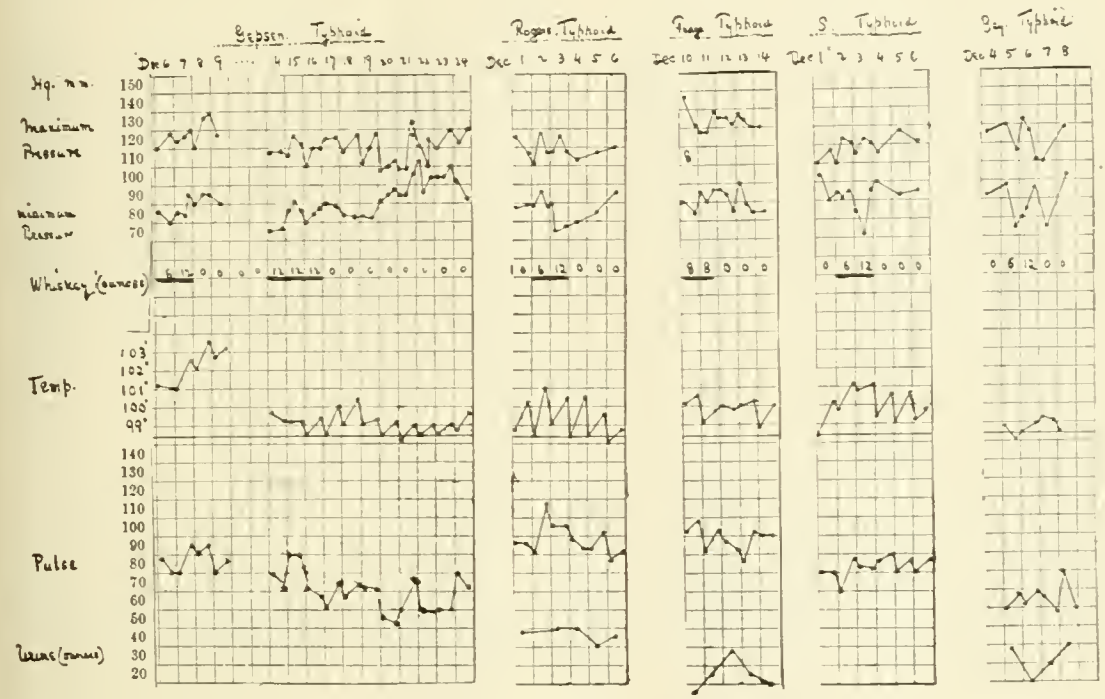


CHART V.—Variations in blood pressure measured every four or eight hours in cases of typhoid, before, during and after whisky.

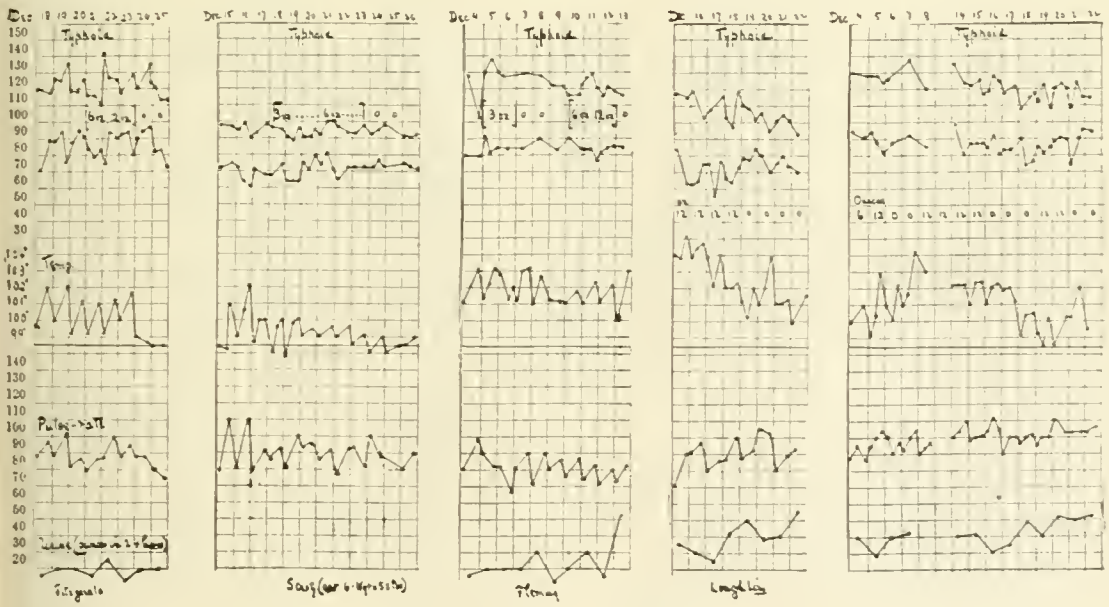


CHART VI.—Same as Chart V.

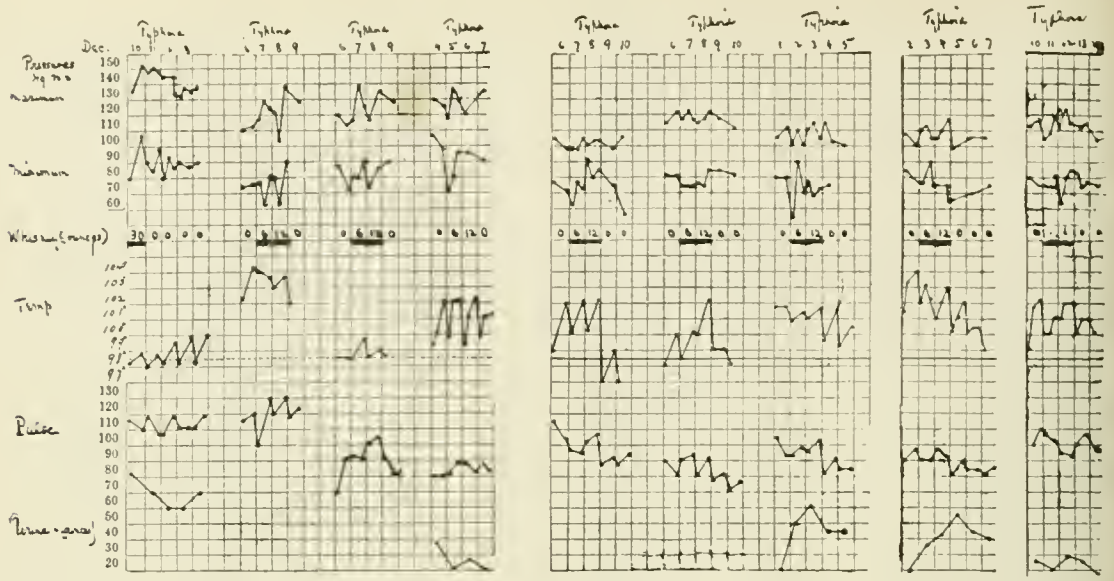


CHART VII.—Same as Charts V and VI.

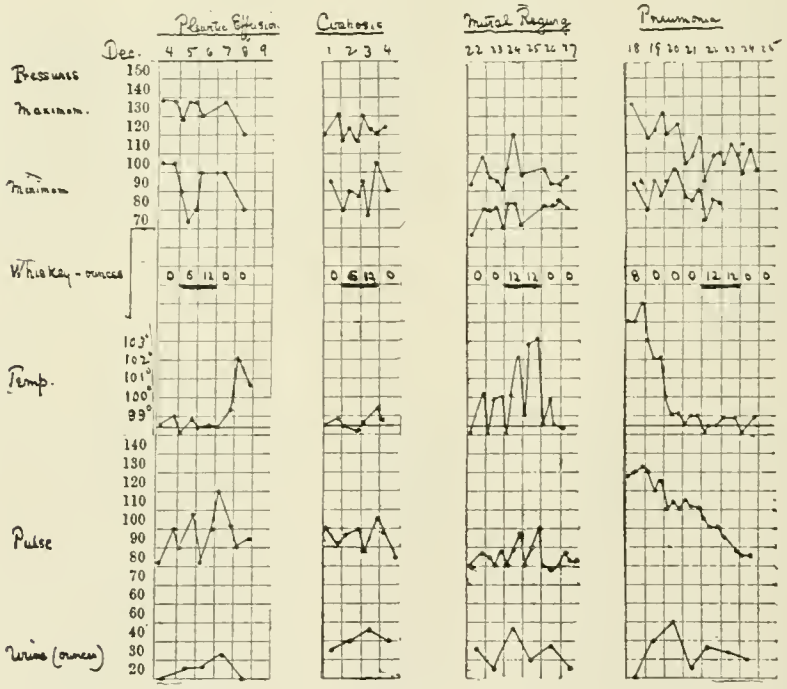


CHART VIII.—Blood pressure in various diseases before, during and after whisky.

*Temperature.*

| | | | | |
|---|---|---|---|---|
| Raised over .2°, | alcohol, 149 cases, | } | Total 161 cases. | |
| " " " | whisky, 12 " | } | | |
| Lowered over .2°, | alcohol, 64 " | } | " 77 " | |
| " " " | whisky, 13 " | } | | |
| Within .2° the same, | alcohol, 70 " | } | " 71 " | |
| " " " " | whisky, 1 " | } | | |
| | | | 309 " | |

*Effect of Alcohol on the Temperature in Febrile Cases (100° or more).*

| | | | |
|---|---|---|---|
| Raised over .2, | alcohol, 29 cases, | } | = 35 cases. |
| " " " | whisky, 6 " | } | |
| Lowered over .2, | alcohol, 20 cases, | } | = 28 " |
| " " " | whisky, 8 " | } | |
| Within .2 the same, | alcohol, 4 cases, | } | = 4 " |
| " " " " | whisky, 0 " | } | |
| | | | 67 " |

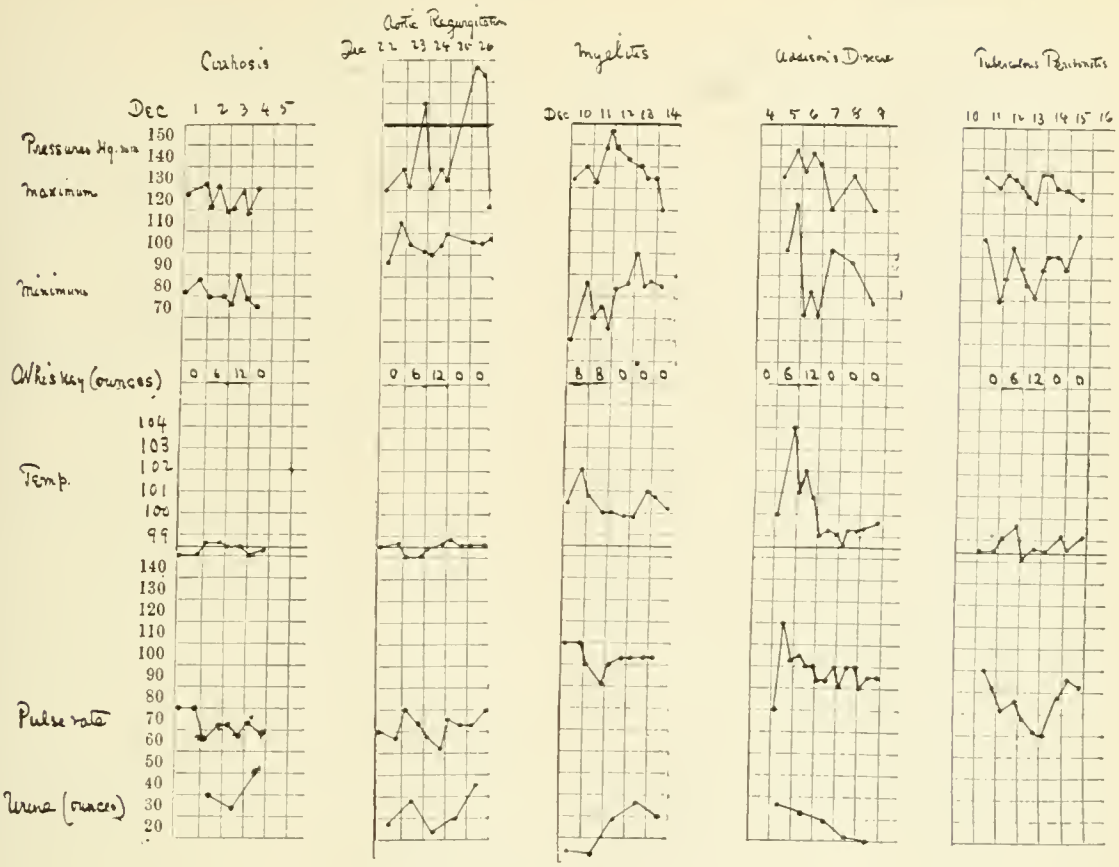


CHART IX.—Same as Chart VIII.

*Pulse.*

| | | |
|---|---|---|
| Raised over 5 beats, alcohol, 98 cases " " " " whisky, 8 " | = | 106 cases. |
| Lowered over 5 beats, alcohol, 56 cases, " " " " whisky, 7 " | = | 63 " |
| Within 5 beats the same: Alcohol, 128 cases, Whisky, 12 " | = | 140 " |
| | | 309 " |

*Respiration.*

| | | |
|---|---|---|
| Raised over 4 periods, alcohol, 22 cases, " " " " whisky, 2 " | = | 24 " |
| Lowered over 4 periods, alcohol, 27 cases, " " " " whisky, 3 " | = | 30 " |
| Rate the same, alcohol, 232 cases " " " whisky, 23 " | = | 255 " |
| | | 309 " |

*Food.*

| | |
|---|---|
| Taken the same | 212 cases. |
| " better | 64 " |
| " less well | 18 " |
| | 294 " |

*Tongue.*

| | |
|---|---|
| The same | 213 cases. |
| Better | 42 " |
| Worse | 20 " |
| Moister and more coated | 6 " |
| | 281 " |

*Skin.*

| | |
|---|---|
| The same | 215 cases. |
| Moister | 39 " |
| Drier | 12 " |
| | 266 " |

*Insomnia.*

| | |
|---|---|
| The same | 155 cases. |
| Better | 7 " |
| Worse | 8 " |
| | 170 " |

*Delirium.*

| | |
|---|---|
| The same | 150 cases. |
| Worse | 3 " |
| Excited and nervous | 1 " |
| Better | 1 " |
| | 155 " |

Total number of observations ..... 2,160 "

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## MALIGNANT TUMORS OF THE TESTIS.

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Malignant disease of the testis is far more likely to be sarcoma than carcinoma. I have personally observed 18 cases of tumors of the testis, of which 17 were sarcoma, and 1 teratoma.

As regards the age of the patients, while malignant disease of the testis is very rare in children, it frequently occurs in young adult life, contrary to the opinion of Butlin, who states that it rarely occurs in adults under thirty years of age. More than one-half of my own cases were young men between twenty and thirty years of age; two of my cases were nineteen years of age, none being younger than that. Nine were between twenty and thirty years of age; five were between thirty and forty years of age; one was between forty and fifty years of age; one was fifty-five years old. These figures do not bear out the statement of some, that sarcoma of the testis is a disease of childhood and old age.

With reference to the etiology, trauma plays a very important part. In 50 per cent. of my own cases there was a distinct history of antecedent injury. In most of these cases the tumor developed so quickly after the injury that there could be no question as to the latter's etiological significance. While at the present day some of the best pathologists refuse to believe that injury has anything to do with the development of malignant disease, the clinical evidence in support of the view that it is of great etiological importance, is very strong.

Antecedent injury in carcinoma of the breast is variously estimated at from 12 to 50 per cent.

Taking sarcomatous tumors as a class, there is a distinct history of antecedent injury in fully one-third of the cases, while in sarcoma of certain localities this percentage is much higher. In sarcoma of the breast every case that I have observed had a local injury prior to the development of the tumor. In sarcoma of the testis there was a local injury to the testis a short time before the tumor was noticed, in nearly one-half of the cases. The very complete statistics of Kober (*Am. Jour. of Med. Sciences*, 1899, Vol. 117, p. 35) giving a carefully tabulated series of 105 cases of sarcoma, collected from literature, shows a history of antecedent injury in 43 per cent. of the cases.

Of 51 malignant tumors of the testis collected by Curling, 6 occurred in patients below the age of twenty years; 5 were under fifteen years. Of 41 cases collected by Butlin, 5 occurred during the first fifteen years of life, the youngest in a child aged eight months.

He believes that there are two periods of life in which the disease occurs more frequently, first, from birth to the age of ten years; second, in the decade from thirty to forty. The great majority of the cases of sarcoma of the testis are of the round-celled variety. The few cases of spindle-celled sarcoma that were collected by Butlin all occurred in patients under ten years of age. While glandular infection as a rule is either absent or only occurs in the latest stages in sarcoma in general, this is not so in sarcoma of the testis. Here we find that involvement of the inguinal and retroperitoneal glands takes place very early.

*Diagnosis.*—The diagnosis of malignant disease of the testis is, as a rule, not difficult. The condition that most closely simulates it is tuberculosis of the testis, but only very rarely does this cause much difficulty. I have recently operated upon a case of tuberculosis of the testis, which very closely resembled sarcoma both as regards clinical history and physical characteristics. The disease was of short duration; there was a history of antecedent injury, smooth symmetrical enlargement, no involvement of the skin, no thickening of the cord; a small amount of fluid in the tunica vaginalis; no family history of tuberculosis, no evidence of tuberculous disease elsewhere. The diagnosis of tuberculosis rather than sarcoma in this case was made almost entirely upon the varying consistence of the tumor itself. In sarcoma the tumor, as a rule, is of uniform consistence, while in tuberculosis the consistence varies greatly, the epididymis being harder than the testis proper. Of course, in the later stages of tuberculosis the enlargement of the cord, early adhesion and ulceration of the skin render the diagnosis perfectly easy. The fact that in tuberculosis the epididymis is nearly always primarily involved, is also an important aid in establishing the diagnosis.

In teratoma, of course, the tumor, being made up of different kinds of tissue, necessarily varies much in consistence, but the larger size and involvement of the entire testis, makes it easy to differentiate it from tuberculosis of the testis.

*Prognosis.*—A careful study of all the recorded cases of sarcoma of the testis, does not permit me to agree with the statement of Kober that "The results of operative interference are very gratifying."

While in my own experience I have never seen a patient cured, it is but fair to state that the complete statistics of Kober show 9 patients that lived and were free from recurrence from 3 to 15 years. His own tables give 11 cases, but a more careful study of the tables shows that in 2 cases there was an error and instead of 9 years, they had remained well less than one year. The 9 cases cured out of 105, gives a percentage of

8.5, lower than perhaps any other variety of sarcoma, except periosteal sarcoma of the femur, which shows less than two per cent. of cures from hip-joint or high amputation.

The duration of the disease is rather shorter than in sarcoma of other localities. Kober's statistics show that in 99 cases the duration was from a few weeks to six months in 28 cases, and in 47 cases it was less than a year, and in 71 cases less than two years. In a few cases the tumor had existed a long period before operation, in 10 cases varying from six to twenty-six years. The rapid course of the disease after castration is illustrated by Kober's tables. Of 114 cases operated upon, 37 were not traced. Of the remaining 77, 41 died in from a few days to three years. Of these 41 fatal cases, 23, or 56 per cent. died within five months, of metastases: 11 others died from seven to twelve months after operation, making 83 per cent. of the fatal cases that died within the first twelve months after operation. Two patients lived beyond three years, but died later of recurrence.

While personally I have not seen a single case of sarcoma of the testis cured, it is but fair to state that in only a small proportion—about one-fourth—did I see the cases at an early stage, the remainder having been treated for recurrences at varying periods after castration. Hence, my own statistics are of little value in forming an estimate of the prognosis of primary sarcoma of the testis.

*Treatment.*—I believe that operation consisting of complete removal of the testis and cord as high up as the internal ring, as soon as the diagnosis is made, is the only proper and rational treatment.

In addition to this I would strongly advise a course of treatment with the mixed toxins of erysipelas and *Bacillus prodigiosus*, for two or three months after operation as a prophylactic measure. I have thus far had the opportunity of using the toxins only in advanced recurrent round-celled sarcoma of the testis, with large retroperitoneal tumors. In some of these cases there has been marked improvement and retardation of the growth for a considerable period, but no permanent cure has resulted. In one case the patient had a long course of X-ray treatment, lasting for months, without any appreciable effect in checking the disease.

The only hope of better results lies in earlier diagnosis, and the practice of delaying for weeks while trying the effect of mercurial ointment, so universally advocated by text-books and surgeons, is, I believe, to be strongly condemned. In the great majority of cases the diagnosis can be made in the early stages if a careful examination is made. In cases of doubt, the dangers of delay are so great that immediate exploratory operation is demanded, with castration, if section of the tumor confirms the suspicions of sarcoma. One should never remove a section and wait for a microscopical diagnosis, since the danger of infected cells being carried to remote parts by the blood current, is, I believe, a real one.

The prognosis of teratoma is very good, yet, though pathologists are inclined to classify this variety as a benign growth, not infrequently recurrence and metastases do occur. My own case is still well over two years after operation.

The following are reports of cases:

*Round-Celled Sarcoma of the Testis Recurrent in the Abdomen. Case I.*—R. C., thirty-three years of age; F. H. good; no history of trauma. The patient first noticed pain in the left testis in January, 1893; the left testis also appeared slightly larger than the right and increased rather rapidly in size. Two months later castration was performed by Dr. A. T. Cabot of Boston, after which the patient remained well for over two years. In July, 1895, he began to have pain in the loins and at about the same time he noticed a swelling in the abdomen.

The patient first came under my observation Nov. 25, 1895, at which time there was a large mass extending from the free border of the ribs down to two inches below the umbilicus filling up nearly the whole left side of the abdomen. The mass was hard, deeply fixed, probably originating in the retro-peritoneal glands. The erysipelas toxins were tried for two weeks without any apparent effect.

*Recurrent Round-Celled Sarcoma of the Testis and Abdomen. Case II.*—C. B., aged nineteen years, first noticed a swelling of the left testicle in January, 1895. The history contains no reference to trauma. The tumor slowly increased in size, without pain, until one year later it had reached the size of two fists. It then became slightly painful and the patient began to complain of numbness of the leg. Examination at this time by Dr. McBurney showed the entire pelvis and abdominal cavity extending as far as the umbilicus, filled with a hard, firmly fixed mass, partly solid and partly semifluctuating. The testicle was removed by Dr. McBurney. An incision was made into the iliac region allowing the escape of five to six ounces of serosanguinolent fluid. The tumor proved to be a typical round-celled sarcoma. The patient's general condition was so bad that no further treatment was advised.

*Round-Celled Sarcoma of the Testis of Traumatic Origin. Case III.*—E. F. K., aged twenty-two years, F. H., good. While attempting to learn to ride a bicycle in the spring of 1896, he fell and injured the left testis. A few weeks afterward he noticed an increase in the size of the injured testicle, but there was no pain until the growth had reached considerable size. In August, 1896, it had become about as large as a closed fist, was slightly painful but not tender. Castration was performed by a Philadelphia surgeon. There were no enlarged glands in the groin. In May, 1897, about eight months after the operation a return of the disease was noticed in the wall of the scrotum and at the lower end of the cord. A second operation was performed

June 24, 1897, the glands in the groin and the redundant portion of the scrotum being removed. Within two weeks after the operation the patient developed severe neuralgic pain in the lumbar region and down the left leg; the pain increased in severity and during the month's hospital treatment he lost 40 pounds in weight. At this time he began to have increasing gastro-intestinal disturbances, severe abdominal pain, nausea and vomiting. Physical examination at that time showed in the iliac fossa a hard, firmly fixed mass, extending nearly to the diaphragm and in the central portion projecting forward to the anterior abdominal wall. The patient died one month later. A very complete autopsy was obtained in this case, the examination showing that nearly every organ in the abdomen and thorax was involved with typical round-celled sarcoma. The entire duration of the disease in this case was one and a half years, or one year after the first operation.

*Recurrent Round-Celled Sarcoma of the Testis. Case IV.*—C. M., twenty-eight years of age, F. H., good. The patient first consulted me on April 26, 1899, having been referred to me by Mr. Watson Cheyne, of London. He gave a history of having fallen from a bicycle three years before, bruising his knee and right groin, causing a swelling of the glands sufficient to keep him in bed for a few days. About two years ago, or one year after the injury, he first noticed a swelling of the right testis. This increased slowly in size without being painful. December, 1898, it measured 12 inches in circumference, was smooth, symmetrical and was at first supposed to be hydrocele and tapped without result. Dec. 10, 1898, castration was performed by Dr. Alfred Fripp, of London. The patient made a good recovery and was well until four months later, when he noticed discomfort in the abdomen, probably originating in the mesenteric glands. The patient came under my care in the latter part of April, 1899, and was treated with the mixed toxins of erysipelas and *Bacillus prodigiosus* from May 1 to October 1. At first there was a decided decrease in the size of the abdominal tumor and improvement in symptoms and general health. The patient was able to go about and a great part of the time during the summer played golf. In October he noticed some loss of weight and the tumor began to increase perceptibly. His condition grew worse rather rapidly from this time on, and three months later he developed a recurrent growth in the spine, causing great pain and, finally, paralysis. He died in the spring of 1900. The entire duration of the disease in this case was three years, or about one and a half years after castration.

*Round-Celled Sarcoma of the Testis, Traumatic. Case V.*—F. H., aged twenty-seven years, farmer by occupation, consulted me July 1, 1898. There was no history of malignant or tuberculous disease in the family. The patient had been well until two years ago, when he was kicked by a horse in the right testicle. A small lump appeared immediately after the injury and, although it never disappeared entirely, it did not increase in size, until about four months before my first observation, when the patient fell through a hay rack, again injuring himself in the same region. Immediately thereafter the old swelling of the testis began to increase rapidly in size. Physical examination made August 8, 1898, showed the right testicle the size of a cocoanut; a portion of the tumor was solid, the remaining part showed distinct fluctuation, simulating fluid in the tunica vaginalis in addition to a solid tumor of the testis. His general health was perfect, the cord was not enlarged and the patient never had any pain. The diagnosis of sarcoma was made and, in view of the history and physical characteristics, castration was advised. I made the incision over the inguinal canal, as in Bassini's operation for inguinal hernia and the entire testis tunica vaginalis and four inches of the cord were removed en masse. The tunica vaginalis contained from four to five ounces of straw-colored fluid. The solid tumor of the testis weighed 12 ounces and 17 grains. The wound healed by primary union. Microscopical examination showed the growth to be a typical round-celled sarcoma. The patient left the hospital in ten days. A recurrence, however, took place in the abdomen and the patient died within one year of the operation. The duration of the disease in this case dating from the time when the small lump in the testis began to enlarge was scarcely more than a year.

*Round-Celled Sarcoma of the Testis—Trauma. Case VI.*—M.M., single, twenty-eight years of age, driver by occupation, first consulted me Feb. 10, 1900, with the following history: No malignant or tuberculous disease in the family; nine years ago had an attack of gonorrhea. Four weeks before calling on me the patient fell astride a bar, injuring his right testis. A swelling appeared at once and did not disappear. Two weeks later the patient noticed that the swelling was increasing in size. There was no pain at first, but later a slight dragging pain on account of the weight of the swelling set in. Two weeks before I saw the patient he visited the out-patient department of Bellevue and was tapped for supposed hydrocele. Nothing but blood, however, was found. A second tapping was done with the same result. Physical examination at the time I saw the patient, at the Hospital for Ruptured and Crippled, showed a tumor of the right scrotum, the size of an orange, symmetrical in shape and semifluctuating; the skin was freely movable. There was little or no tenderness on pressure. In view of the very rapid development of the tumor, following a rather severe injury, the diagnosis of hematocele with possibility of sarcoma, was made and immediate operation advised. Two days later I operated at the General Memorial Hospital. On opening the tunica vaginalis, about four ounces of dark, grumous blood escaped. The testis was found enlarged to

about three times its normal size and was so soft that it closely simulated fluctuation. Being convinced that it was malignant, I continued the incision up into the inguinal canal and removed the entire testis and cord very high up. The specimen was carefully examined by the pathologist of the hospital and pronounced at first non-malignant. I was so sure, however, from the clinical history and the gross appearance that we had to deal with a sarcoma of the testis, that I insisted on a more careful examination and after numerous sections, the pathologist found an area showing the typical structure of a round-celled sarcoma. At this time there was no evidence of any trouble in the abdomen. The subsequent course of this case is of very great interest.

Within two weeks after leaving the hospital, he was admitted to the service of Dr. B. F. Curtis of the Bellevue Hospital with a large abdominal tumor. March 16th, or less than five weeks from the date of my own primary operation, Dr. Curtis made an exploratory incision and found a large tumor involving the right kidney and probably retroperitoneal glands, the size of a man's head, of soft consistence and surrounded by a thin capsule, closely adherent to the large intestine and stomach, having apparently developed between the layers of the mesentery. Dr. Curtis states that there was almost no glandular involvement and the portion of the tumor, removed for microscopical examination, was pronounced round-celled sarcoma. The patient died on the 18th of April of progressive cachexia and persistent vomiting from pressure on the duodenum.

This case is most remarkable in that the whole course of the disease, from the date of injury, January 10, to the date of death, April 18, was scarcely more than three months. It also furnishes a most convincing example of acute traumatic malignancy, the causal relation between the injury and the development of the sarcoma being beyond question.

*Recurrent Sarcoma of the Testis. Case VII.*—W. T., aged thirty-two years; born in the U. S., no trauma, was seen in consultation with Dr. Dowd, January, 1900. The patient first noticed a small lump at the bottom of the right testis in June, 1899. This grew rapidly, but was never painful. Nov. 15, 1899, the testis was removed by Dr. L. Boulton Bangs. The tumor measured nine inches in circumference. The patient complained of severe pain in the back before operation, exactly the same as at the time of his admission to the General Memorial Hospital, although no enlargement of abdomen was noticed at that time. A curious phenomenon as regards the periodicity of the pain was observed in this case. Very severe pain developed in the groin and back every Tuesday and Friday at 3 P.M. Shortly after the operation a tumor was discovered in the abdomen and January, 1900, several masses could be felt in the abdominal cavity, apparently the retroperitoneal glands. There was also local recurrence in the cord and the patient died a few months later. The whole course of the disease in this case was a little more than a year, and less than six months after operation.

*Recurrent Round-Celled Sarcoma of the Testis, no Trauma. Case VIII.*—L. K., twenty-eight years old, born in Russia; occupation, shop work. The patient consulted me March 29, 1901, having been referred to me by Dr. W. B. De Garmo. Two years prior to this, he first noticed a painless enlargement of the right testis. The first operation was done on Dec. 8, 1899, by Dr. De Garmo at the Post-Graduate Hospital. A recurrence was noticed in the glands of the groin in September, 1900, about ten months after the operation. In December, two months later, he began to have severe lumbar pain and there was rapid decrease in weight. On March 29, 1901, when he consulted me, there was a large recurrent mass in the abdominal cavity in the retroperitoneal region. The patient was greatly emaciated and his condition was considered hopeless. Of the exact duration of his life, after this, I am not aware.

*Round-Celled Sarcoma of the Testis, Recurrent. Case IX.*—P. H., thirty-eight years of age; mining engineer by occupation. F. H., maternal grandmother died of cancer of the breast. P. H., the patient, has always been a great horseback rider. Four years ago he first noticed a small painless enlargement of the left testicle. As the tumor enlarged in size, he had some discomfort and dragging sensations in the cord. Operation one year after discovery of the trouble. The patient remained free from a return for two years and at this time he passed a satisfactory examination by the Equitable Life Insurance Co. Shortly after that he began to have pain in the back and was treated for lumbago. Instead of losing flesh his weight, which normally was 137 pounds, had increased to 145, at the time of my first examination, July 16, 1900. This increase was largely due to the great edema of the leg and thigh. At this time he had a great deal of pain which was worse at night. His left leg began to swell Jan. 1, 1900. Physical examination July 16, 1900, showed the left leg and thigh very greatly swollen and a hard mass in the left iliac region. The patient's general condition was fairly good, although he was slightly emaciated. He was treated for several months with the mixed toxins of erysipelas and *Bacillus prodigiosus*, and although there was marked temporary improvement, after a while the toxins seemed to have lost their effect and the disease progressed, causing death about six months later.

This case is distinct from the fact that the patient remained in perfect health for more than two years after operation and then had a recurrence which proved fatal.

*Round-Celled Sarcoma of the Testis. Case X.*—T. B., thirty-two years old; Italian, consulted me April 1, 1902. He stated that he had had a small tumor of the testis for twenty-two years; there was, however, no increase in size until eight months ago when it began slowly and

steadily to increase in size. There was no pain. At the time of my observation the tumor was of about the size of an orange, symmetrical in outline, skin normal, consistence slightly varying, testis and epididymis both involved; cord not enlarged. Operation April 2, 1902, at the General Memorial Hospital. Testis and cord were removed through Bassini's incision for hernia; there was no fluid in the tunica vaginalis in this case. Subsequent history is not known.

*Sarcoma of the Left Testis. Case XI.*—R.M., aged twenty-seven years, F. H., good. P. H. Fourteen years ago, while playing ball, the patient was struck in the left testis. A small lump was noticed which never entirely disappeared, but did not increase in size until six years ago. Castration was performed Oct. 3, 1900, by Dr. James Peterson. A second operation was performed shortly afterward for local recurrence. The patient was referred to me by Dr. Peterson, and physical examination April 23, 1900, showed a large recurrent mass in the abdominal cavity. No further treatment was advised as the patient was greatly emaciated and the mass in the abdomen was so large that it was not thought advisable to try the toxin treatment. The subsequent history of the case I have been unable to trace.

*Sarcoma of the Testis—Trauma. Case XII.*—C. G., forty-two years of age. F. H. good; brother died of phthisis. P. H. Eight months ago the patient injured the right testis while lifting, but there was no increase in size. Five months ago he again struck the same testis against a work-bench. Swelling developed immediately and slowly increased in size, causing no pain, except a dull dragging sensation. Physical examination, Oct. 25, 1901, shows the right testis as large as an orange. The whole testis seems transformed into a symmetrical tumor of solid consistence. There is a slight amount of effusion in the tunica vaginalis, no enlargement of the cord, no adhesion to the skin nor any of the characteristics of tuberculous disease. Clinical diagnosis: Sarcoma. Patient refused operation, hence there is no microscopical confirmation of the diagnosis.

*Recurrent Sarcoma of Testicle. Case XIII.*—A. W., fifty-five years old; F. H. good; occupation, painter; no history of trauma; does not ride bicycle. He first noticed a painless swelling in the right testis in July, 1900; this slowly increased in size but never became painful. July 24, 1902, the patient was operated upon at the German Hospital, by Dr. Willy Meyer, the left testicle being removed. A recurrent growth soon appeared on the right side, just above the testis. This was removed October 7 and microscopical examination made at the German Hospital showed the growth to be large round-celled sarcoma. Rapid recurrence followed the second operation, recurrence taking place in the pubic and inguinal regions, also at the base of the scrotum. The patient was referred to me by Dr. Willy Meyer, Nov. 24, 1902. Physical examination at that time showed an ulcerating mass in the left groin extending to the base of the scrotum involving the entire pubic region; retroperitoneal glands not markedly involved. General condition of the patient fair; has apparently lost little weight. There is considerable discharge from the growth of extremely foul odor. The patient entered the General Memorial Hospital November 25 and received X-ray and toxin treatment for about two months. The foul odor, which was very pronounced at the time of his admission, nearly disappeared under the treatment and there was a slight decrease in the size of the tumor. The patient was discharged owing to insubordination at the end of this time.

*Recurrent Round-Celled Melanotic Sarcoma of Left Testis, Traumatic. Case XIV.*—G. S., twenty-nine years of age; perfectly well until he fell from a bicycle in August, 1896, injuring the left testicle. A tumor appeared in the early part of September, within two to three weeks of the injury. This increased rapidly in size. The first operation was performed in January, 1897, by Dr. Millbank of Albany. Recurrence quickly followed in the cord and inguinal glands. Four operations were performed, the last two by myself. The erysipelas toxins were then used for two to three weeks, without effect. The tumors quickly recurred and systemic infection soon followed causing death in January, 1898. The entire duration in this case was fifteen months.

*Teratoma of the Testis. Case XV.*—Mr. J., twenty-seven years of age, German, always in perfect health; no trauma. In April, 1900, he first noticed a slight enlargement of the testicle. This increased uniformly, without pain, until the time of my first observation, Dec. 10, 1900. Physical examination then showed a tumor about the size of an orange, symmetrical in shape, very firm in consistence, giving all the characteristics of a sarcoma of the testis, which was the clinical diagnosis made. The glands of the groin were not enlarged and general health was perfect. Operation Dec. 12, 1900, consisting in removal of the testis and the cord as high up as the internal ring. The wound healed without suppuration. Feb. 18, 1903, the patient was exhibited before the Genito-Urinary Section of the Academy of Medicine, in perfect health.

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## ALCOHOLISM IN WOMEN.*

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IN my paper "Alcoholism in Women, Its Cause, Consequence and Cure," read before the New York Medico-Legal Society, October 20, 1897 (*N. Y. Medical Record*, Nov. 13, 1897), attention was called to some points peculiar to this neurosis in women.

From its heredity she is more often exempt than man. We know families in which the sons

* Read at the Annual Meeting of the American Association for the Cure of Inebriety, Boston.

inherit the father's inebriety almost as naturally as they do his name or fortune, while the daughters show the strongest repugnance for the poison, especially if the mother be the inebriate. From physical ill health and discomfort she seeks relief in the delusive draft, and so tends swiftly and surely to cross the line where volition ends and disease begins, thus proving anew the popular error as to mere vicious indulgence. Secret drinking is the rock upon which many a woman's life is wrecked. With innate modesty she shrinks from publicity, and often so skilfully hides this weakness from family, friends and even her physician that ere they are aware, she is a confirmed inebriate.

Such a case was brought to my care the past year. Mrs. A., age twenty-nine years, of good ancestry and training, began taking beer by medical advice seven years ago as an aid to lactation. From this she indulged in wine and stronger drinks, in increasing amounts, until for nearly a year before coming under treatment, she was drinking one quart of whisky each day. As to be expected, the havoc from such excess was soon in evidence. Collapse came suddenly, with complete paraplegia and entire loss of power over bowel and bladder. Respiration was irregular and heart action weak—120 and over. There was general anesthesia, incoordination of arms and fingers, and the special pains of alcoholism girdling limbs about the joints. Two years ago she began having attacks of petit mal in the early morning before rising, and these continued, at irregular intervals, until the whisky was entirely withheld. Amnesia was a special feature, making her family think her insane, and despair of her recovery. There were visual hallucinations, with delusions of persecutions, great fear of poisoning, and memory was a complete blank. It was the most pronounced and pitiable case of alcoholic excess I ever knew.

As a prelude to special treatment, active measures were taken to eliminate the poison through every possible channel. Under tonic treatment she improved slowly, but surely. Full feeding, much milk and malt were continued for months. Strychnine nitrate, with solution of arsenic and gold—arsenaura—were given. Electricity, massage and suggestion were used. At the end of four months she had so far recovered as to leave sanitarium care, and return home, where, under glycerophosphates, she continues to improve.

Some points in this story merit more than passing notice. The risk in some cases of prescribing even beer, is large. The need of careful search in obscure and recurring illness, to settle the question of secret drinking, is obvious. The relation of alcoholism to epilepsy is of great interest and far-reaching import. Certain facts in recent papers by Dr. Crothers and Dr. Louise Robinovitch prove a close connection between these neuroses. Not only is the toxic power of alcohol acutely genetic, but the chronic curse is so marked that 64 per cent. of epileptics have an alcoholic ancestry. The wisdom of limiting offspring in such patients as Mrs. A. for several years, till the system has regained its own, is also obvious. Lastly, the result proves the value of well-directed, persistent treatment, and should promote optimism in those inclined to think such cases beyond the reach of the healing art.

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## ALCOHOLIC TOXEMIA: ITS PATHOLOGY AND TREATMENT.

BY THOMAS D. CROTHERS, M.D.,
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IT may now be taken as demonstrated that the various affections of the body and mind which are produced directly or indirectly by alcoholism are due to toxemia. A study of the pathology of such diseases shows that alcohol acts in a very similar manner to other poisons. The effects may be the result of one or two glasses of spirits or of a long course of drinking. They differ of course in degree, but are more or less the same in character. This fact having been established, it becomes essential that the profession should revise and indeed revolutionize its method of dealing with such conditions. There are no affections in modern times that call so frequently for medical care as those traceable to alcohol, and none which are treated so inefficiently and dangerously, because of the false conception that has hitherto prevailed as to their origin and cure.

The first mention of delirium tremens, as such, in medical literature was made by Dr. Thomas Sutton, of London, in 1813. Twenty years later the term found its way into the text-books, from which it is now commencing to drop out. It is in reality a rare disease, though other forms of alcoholism, which are often confused with it, are sufficiently common. The characteristic features of delirium tremens are muscular trembling and peculiar delusions. The general name for such diseases as a class is alcoholism.

A word as to the etiology of so-called alcoholism and diseases following it. These diseases are commonly supposed to result from alcohol alone. This is an error; the same symptoms follow diverse and most complex causes. Thus a man who has been thrown from a wagon and stunned, on recovering commences to "see sights and hear sounds," and if he is known to have been a drinking man the delusions are at once put down to alcohol. Yet, the alcoholism may have been only an indirect and predisposing cause, the direct cause being the traumatism. The pathological changes which follow alcoholism are alike, and resemble those which follow from other causes, as for example, traumatisms, infectious diseases, fevers, inflammations and some other acute diseases. In all cases followed by delirium, there are clearly states of narcosis for which toxins are largely responsible.

The progress of different cases varies widely, the disease sometimes extending over years, while at other times it lasts only a short time, but there

are the same general symptoms in all serious cases. Thus if a man suddenly develops delusions —thinking he hears sounds that no one else hears, or sees things which are non-existent, and if afterward he gets into a state of violent excitement accompanied by muscular trembling, the prognosis is more or less grave. If, on the other hand, he wakes up confused, wondering where he is, and who other people are that are in the room, the probability is that the condition is transient and will soon pass away; but it is none the less evident that a pathological change has taken place. The toxemia is present in both cases. When the symptoms take the form of so-called delirium tremens, it shows that organic changes have occurred of a serious character.

In all these cases alcohol acts first on the blood vessels. The vasomotor nerves surrounding the blood vessels become paralyzed. They alternately dilate and contract, breaking up the uniform flow of the blood and diminishing the nutrition of the artery. Then follows mechanical obstruction, with increased labor of the heart, also increased tension and feebleness. This condition is followed very soon by other changes due to the failure of nourishment. The coating of the arteries becomes thickened or thinned at different points and fibrous deposits form, producing sclerosis. This process is more prominent in the arteries of the brain, but corresponding changes may occur all over the body. As a result the heart increases in size and becomes hypertrophied, and cirrhosis of the liver and other serious affections of like character occur. The men seen on the street with extremely red congested faces are suffering more or less from vasomotor paralysis. Later on venous congestion will appear, and the whole circulatory system will become deranged, because oxidization has diminished.

Secondly, alcohol acts on the blood, reducing the number of red corpuscles which carry the oxygen. At the same time the number of white corpuscles is increased. Their lives become shorter and shorter, and ultimately they divide and subdivide, destroying the material that was intended to give nourishment to the blood vessels.

Alcohol, in the third place, acts on the nervous tissue, producing the condition which is commonly known as neuritis. A person long given to alcoholic indulgence complains of pains in the legs, or arms, or other parts of the body. It is called rheumatism, and very frequently he is treated for that. In reality, it is neuritis. It is a very common disease—beer drinkers in particular suffer from it; but it is seldom diagnosed as such. Most frequently, it is supposed to be rheumatism, and the patient is treated accordingly with all sorts of drugs and outward applications. At the same time, he continues drinking, and therefore it is not surprising that he does not improve. All the while that he is taking medicines given by his physician to remove the symptoms, he is feeding the toxins which produce them.

In regard to the action of alcohol on the blood cells some interesting experiments have been made on dogs, which were given certain quantities of alcohol and afterward killed. An examination of the brain cells of these dogs showed that the same changes had taken place that occur in animals subjected to excessive fatigue. Thus there was a shrinking of the coats of the nerves and a consequent corrugation of the nerve cells: and anemia and sclerosis followed. Yet recently, at the Academy of Medicine, a doctor read a paper on the subject of arteriosclerosis, and mentioned spirits as a good remedy for this disease. In other words, for the cure of a condition of anemia and fatigue he ordered a drug which produces the same pathological conditions. The same speaker incidently mentioned that a large proportion of those who died from arteriosclerosis were physicians. In fact he said it was peculiarly a doctor's disease, and the cause he suggested was worry! Perhaps worry may have something to do with it, but it is also possible that doctors like other people indulge too much in the use of stimulants.

Another curious fact which may be touched upon in passing is that statistics show that in modern times the mortality from delirium tremens has been reduced from 50 per cent. to 10 per cent., while the mortality from other forms of alcoholism, which used to be 10 per cent., has increased to 50, 60 or perhaps 70 per cent.

Having given this general statement of the results of alcoholism, we come to the important question of treatment. The usual custom is to take away the alcohol gradually with the view of avoiding shock, and then to give the patient narcotics for the purpose of keeping him asleep. I do not believe there is any basis for these theories. The removal of the alcohol is the first thing to be attended to. It should be stopped entirely and at once. There is no shock caused by the taking away of other poisons. Why should we apprehend it in the case of alcohol? What danger there is arises from the fact that, by stopping the production of alcoholic toxins, you may give more room for the play of other toxic agents. These, however, must be dealt with as they arise: the first thing is to remove the alcohol, which is the main cause of the general toxemia. The toxins generally may be expelled from the system by elimination. With a view to this the bowels should be opened by means of salines, and baths and other means used to stimulate the pores of the skin. These two things are absolutely essential—sharp purgation and sweating. The best results follow from prolonged and continuous elimination by this double process.

As to narcotics, I make a point of not giving any drugs of this class until the toxins have been expelled, and neither do I give food until the acute stage has been passed.

When, however, the patient is convalescent, attacks of insomnia may occur, and to relieve these, special treatment, including some of the milder sedatives, may be necessary. In this connection I have found some of the coal-tar products

useful, and good results have been obtained from chloretone. This is a tertiary butylic alcohol of the anesthetic group, and appears to have very marked value where other drugs are impotent. In the insomnia which follows the withdrawal of opium as well as alcohol it works well, without producing any of the unpleasant after-effects which so commonly result from the use of other narcotics. I have given chloretone freely, and not noticed any cumulative action. Its hypnotic effect becomes apparent within half an hour or more. In the so-called delirium tremens, after the bowels have been freely moved and free perspiration established, and the delirium has subsided, it may be given in large doses of fifteen or twenty grains. I may add that it is best given at night. The anesthetic action of the drug is favored by external circumstances. Other narcotics may be given during the day, but chloretone is more effective and pleasing as a night dose. For the neuritis and lumbago so common in alcoholic cases, it is especially indicated, giving in many cases almost absolute relief. Its anesthetic effects seem very general. I have not noticed any resultant trouble in the stomach or derangement of the processes of nutrition. Professor Wilcox, who has written an exhaustive article on the subject, suggests that, as a result of the action of the drug the dendritic filaments lose touch of one another, and the protoplasmic processes are thrown out of contact with the motor cells—sleep, in other words, being produced by cell retraction. My personal experience is that after the drug has been administered, the patient's excitement and irritation quickly subside—not always to the point of sleep or unconsciousness, but at all events to a condition of serenity and quiet dreamy relaxation. So far I have not heard of any bad effects following its use, and therefore I would be disposed to place it among the safest as well as most reliable of the anesthetics and hypnotics now on the market.

The after-treatment should continue—the salines and baths, the latter daily, and with this the bitter tonics of which cinchona is the best. Arsenic is a valuable remedy, and the same may be said of some forms of phosphoric acid. For the alcoholic craze strong infusions of quassia will be found effective. All other remedies should be subordinate to means and measures which act on the skin and encourage elimination. Often this general treatment should be continued for a long time.

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## INFANT FEEDING—A SCIENCE AND ART.

BY JOHN F. CONNORS, A.M., M.D.,
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*Science of Feeding.*—No subject can be more interesting to the student or general practitioner than the scientific artificial feeding of infants, but the perplexing question is to know what is a scientific method of infant feeding. So many methods have been advocated and the authorities can be quoted with such positiveness both for and against some of the methods, that all attempts at harmonizing different views fail. If this state of affairs means anything, it means that infant feeding is not governed by hard and fast rules.

Peptonized, sterilized, Pasteurized, humanized and modified cow's milk have all been the fashion and each has developed drawbacks. At a superficial glance exact percentage modification of milk looks very plausible, and yet there are few authorities to-day who believe that exact percentages of the different ingredients of cow's milk in the infant's food is the solution of the infant feeding problem. Indeed, Wentworth has shown that feeding mixtures put up in a laboratory, which is supposed to stand for exactness, vary greatly in composition from the prescriptions. If exactness of composition has any value and it cannot be obtained in laboratory feeding it might as well be dismissed as unattainable.

The latest scheme is the so-called differential modification of the proteids of cow's milk so as to resemble those of human milk, it being assumed that the proteids of the two milks are caseinogen and lactalbumin, which vary in relative and actual quantities in the two milks. This looks beautifully simple on paper but ends there. An hour's laboratory work in comparing cow's milk and human milk would do more to clear up this subject in the student's mind than reading a dozen theoretical papers.

Dilute a specimen of cow's milk with three parts of water; add acetic acid until a precipitate ceases to form; allow to settle and filter. Fat and casein will be on the filter paper. Boil the filtrate, and albumin will coagulate. Again filter, and to the filtrate add common salt nearly to saturation, and then a strong solution of tannic acid and albumoses and peptones will precipitate. Dilute another specimen of the milk with one part of water in a cup or bowl, add a drop or two of liquid rennet and slightly acidify with acetic or dilute hydrochloric acid. Now warm up to blood heat and notice the *clotting and shrinking* of the curd during five or ten minutes. Remove the curd and toss it about and notice how leathery it becomes. Repeat the experiments with breast milk and the vast chemical and physical differences between cow's milk and human milk will be appreciated. Furthermore, it has been found that after injecting milk subcutaneously or intraperitoneally into an animal, a serum can be obtained that will precipitate the proteids of that milk and of no other. According to Vaughn and Novy "the serum of animals that have been treated as described with milk, is designated as lacto serum, and it has been found that the lacto sera are in all cases specific in their reaction. Indeed, the discovery of this reaction has shown that the proteids of the milk of different species of animals differ from those of every other species, and it certainly should convince us that it is impossible by any chemical process to make cow's milk a perfect substitute

for the mother's milk in the feeding of infants." Rennet and the acid which cause the proteid of milk to curd are found in the gastric juice, so it will be seen that after milk enters the stomach it naturally ceases to be a "fluid diet." It has been known for a long time that the milks of different species of animals had different curding properties. Chapin has recently called attention to the fact that the curding of milk is to develop the motor functions of the digestive tract, the milk of each species of animals curding in the stomach so as to develop the motor functions peculiar to that species.

The profound effect on nutrition that the failure to develop this function may have, has been shown by some experiments on calves, mentioned by Henry. They ate enormous quantities of milk and grain, but failed to thrive. One calf was given some straw with its food and in a few hours was chewing its cud and thrived thereafter; another calf was not given any coarse bulky food and died. Holt says that some infants who do not thrive on low proteids (highly diluted milk) thrive if less food is given in a more concentrated form (high proteids) which would produce a bulkier curd and thus call forth more mechanical effort. For this reason it is easy to see why peptonized milk in which no curd forms is not suitable as a steady diet for an infant. The formation of a soft curd in the stomach is natural and essential to the normal development of the infant's digestive tract. The essential difference between cow's milk and human milk is in the quantity and character of the curd formed from the proteid by the action of the gastric juice and this difference can not be adjusted by simply varying the percentage or quantity of proteid in the infant's food. Digestion in the cow is a very slow process and in the human being much more rapid. Proteid of cow's milk is much more slowly digested than the proteid of human milk. Nature has a purpose in this, viz., to prepare the undeveloped digestive tract for its future work.

As it is impossible to make human milk, it is essential that there should be some basis for feeding about which there can be no dispute. In this connection it is fortunate that investigators in the nutrition of the lower animals have arrived at some of the same conclusions that have been arrived at in infant nutrition.

Jordan, in his book "The Feeding of Animals," says: "It is time to break away, if we have not already done so, from an undiscriminating adherence to mathematical doses of nutrients, the accuracy of which is supposed by some to outweigh all other considerations and to determine success in feeding. . . . No working animal can be successfully fed by mechanical rules. . . . The ration must be adapted to the species. . . . A ration may be chemically right but practically wrong. . . . The nitrogenous tissues are those that largely determine the vigor and quality of any animal, and as these are formed rapidly in the early stages of growth, a normal and unrestricted growth demands an abundant supply of proteid food. . . . The study of the requirements of the individual animal and the adapting of food to its needs is to be preferred to placing the herd as a whole upon any inflexible ration. . . . Clearly the physiological standards may supplement, and in some measure guide judgment, but cannot take its place. . . . Palatableness is an important factor in successful feeding. Without doubt the success of one feeder as compared with the failure of another may sometimes be due, in part, to a superior manner of presenting a ration, . . . and to manipulations that add to the agreeableness of its flavors."

Holt says: "Success in infant feeding is largely a question of close observation and careful attention to details. . . . Not much is to be expected from fractional variations in the milk percentages when those given are producing a great deal of disturbance. . . . One whose digestion has become seriously deranged while taking milk is sometimes helped by nothing so much as temporarily withdrawing all milk. Such a course is often better than wasting time in juggling with fractional milk percentages, when one or two intelligent trials have been entirely unsuccessful. . . . The most brilliant results are often obtained from as complete a change in diet as possible. . . . Nothing but personal experience will enable one to judge aright as to the combination best suited to the existing conditions. In any case the first prescription must be an experiment. . . . Except to start with too high proteids no more common mistake is made than to continue long with too low proteids. Anemia, malnutrition, and, I believe, not infrequently scurvy, are seen as a consequence of this practice."

Holt's observation as to the effect of low proteids has been experimentally confirmed on pigs many times. The pigs fed low proteids were fat, anemic, stunted, rachitic and in every way poorly developed and of low vitality, being very susceptible to the ravages of hog cholera, while those fed on high proteids were strong, muscular and of great vigor.

It will, therefore, be concluded that the chief requisites of a successful infant feeder are a knowledge of the principles of nutrition especially as they apply to infancy, and an abundance of common sense. He must work out the details of each case and not feel that he has mastered the subject when he has learned some formulas for modifying milk.

Theoretically an infant's food should furnish about the same quantities of fat, proteids, carbohydrates and mineral matter as breast milk, and should also have the property of developing the motor functions of the digestive tract. Cow's milk is by common consent the best basic material to work with. Unfortunately it is very often both chemically and practically wrong. To make it practically right (digestible) by reducing the proteids it may be made chemically wrong

and when made chemically right it may be practically wrong. If all infants could digest cow's milk there would be few cases of malnutrition. The aim in infant feeding should be to get the infant to take plain cow's milk as soon as possible. How soon this can be accomplished depends on the individual infant. In most cases it will not be before the end of the first year and may be longer. By beginning with diluted milk and reducing the dilution gradually, the proportion of milk the infant receives is increased as fast as it can digest it.

In diluting the milk the proteids are reduced to a low point, and every effort should be made to allow as much as possible of the proteid to be converted into tissue. This can be done by making up the fat and sugar that have been reduced in quantity by diluting the milk. When this is done the infant gets practically cow's milk with the indigestible element, proteid, reduced in quantity. It is to accomplish this purpose that the various milk, cream and sugar mixtures have been proposed, and the many mathematical tables devised for calculating the proper quantities to combine. The simplest method that could be employed would be to dilute milk which was extraordinarily rich in fat or cream and add sugar. By the use of bottled milk and the Chapin dipper this method can be employed wherever there is average intelligence.

If the fat in the infant's food is to be kept up to anything like the amount in breast milk, the cow's milk that is to be diluted much must be rich in fat; that to be diluted less, poorer in fat.

One thing that the practitioner should dismiss from his mind is the idea that he can get milk or cream of definite richness unless he makes an assay of each specimen he uses, which is neither feasible nor necessary. Milks of different dairymen differ in richness, and a little experience with the Babcock Milk Tester in testing the milk from a number of dairies would show of how little value in practice are tables showing the *average* richness of milk and cream in fat.

The problem is to fit the milk at hand to the infant under consideration and a direct trial is the only way to find what strength of food can be taken.

In cities a high grade of milk can be obtained in bottles. In the country the dairyman should be instructed to bottle his milk as soon as possible after milking, and set the bottles on ice or in cold water to rapidly cool the milk. This will greatly retard the growth of the bacteria in the milk and will also promote a rapid separation of the cream.

After the cream has risen the top 9 ounces in the bottle when removed and mixed, will be *three* times as rich in fat as the original milk was; the top 14 to 16 ounces *two* times as rich, and the top 20 ounces *one and one half* times as rich. The proteids and sugar in these top milks are about the same as in whole milk. By mixing the cream and milk in the bottle whole milk will be obtained; by removing the cream, skimmed milk nearly fat-free will remain. By using bottled milk the milk is kept freer from contamination, bacterial growth is retarded and milk of almost any desired *proportional* richness in fat can be had without any mental effort. The actual richness of the top milks will vary directly with the richness of the original milk. Whole milk contains anywhere between 3 per cent. and 5 per cent. fat, so the top 9, 15 and 20 ounces will contain respectively 3, 2 and 1½ times these percentages. The top 9 ounces 9 to 15 per cent. fat, top 14 to 16 ounces 6 to 10 per cent., top 20 ounces 4½ to 7½ per cent. For the infant all changes are made by varying the dilution of the top milks and adding sugar, so in practice the richness of the milk makes little difference. In every case the milk is diluted to suit the infant's digestive capacity.

The proportional richness of these quantities from the bottle has been shown to be correct by Chapin, Holt, Judson, Gittings and Wentworth. The only error that can be made is getting less fat in the food some days, which would happen if the cream had not risen completely. This error would always be on the safe side.

To bring the sugar up to the necessary amount, 5 per cent., or one part of sugar to 20 parts of food is added for all dilutions greater than one part of milk to two parts of diluent. One part to 30 or 40 parts for less diluted food.

For removing these top milks a flat bottomed dipper is to be preferred, as it will stand up alone, when the first ounce is taken out of the bottle with a teaspoon, which usually requires the use of both hands. It is surprising how little the cream is disturbed by inserting the dipper. The skimmed milk often shows not over .4 per cent. fat.

The following table will show how to begin with a small quantity of a weak food and gradually increase the quantity and strength without any calculations by simply diluting the milk, also the range of composition of the mixtures when poor or rich milk is used.

| Number and size of feedings | COMPOSITION. Fat % | | Proteids % | | Sugar % | INGREDIENTS. Milk | | Diluent | Sugar |
|---|---|---|---|---|---|---|---|---|---|
| | Poor milk | Rich milk | Poor milk | Rich milk | | | | | |
| 12—2 ozs. | 1.50—2.50 | | .50— .66 | | 6.00 | Dip off top 9 ozs. and use | 4 ozs. | 20 ozs. | 1 oz. |
| 10—3 ozs. | 1.80—3.00 | | .60— .80 | | 6.00 | of this | 6 ozs. | 24 ozs. | 1½ ozs. |
| 9—4 ozs. | 2.25—3.75 | | .75—1.00 | | 6.00 | Top | 9 ozs. | 27 ozs. | 2 ozs. |
| 8—5 ozs. | 2.20—3.60 | | 1.00—1.33 | | 6.00 | Top | 13 ozs. | 27 ozs. | 2 ozs. |
| 7—5½ ozs. | 2.20—3.60 | | 1.20—1.60 | | 6.00 | Top | 16 ozs. | 24 ozs. | 1½ ozs. |
| 6—7 ozs. | 2.25—3.75 | | 1.50—2.00 | | 6.00 | Top | 20 ozs. | 20 ozs. | 1½ ozs. |
| 6—8 ozs. | 2.00—3.30 | | 2.00—2.70 | | 6.00 | Whole milk | 32 ozs. | 16 ozs. | 1½ ozs. |
| Whole milk ad. lib. | 3.00—5.00 | | 3.00—4.00 | | 5.00 | Whole milk | | | |

In measuring the sugar two level tablespoonfuls of granulated or three of milk sugar equal one ounce.

If whole milk is used in making up all mixtures the range of composition for any dilution can be found by dividing the composition of whole milk —fat 3 to 5 per cent.; proteids 3 to 4 per cent.; sugar by 4 to 5 per cent., the number of times the milk is diluted. In diluted whole milk the proteids would be about the same as if the top milks were used, but of course the fat would be less. It will be noticed that the proteids in the feeding mixtures are increased from .1 to .3 per cent. at a time during the reducing of the dilution from 1 to 5 to 1—1 which is all that could be desired in small fractions. The fat in these mixtures is kept rather low, as experience shows that running the fat up too high greatly interferes with digestion.

It will be seen that in the high dilutions of milk the amount of proteid in the food is much less than the quantity found in breast milk (1.5 per cent. to 1.75 per cent.). As the infant's vigor and vitality depends on the quantity of proteid stored up, any method to increase the quantity of proteid the infant can digest should be employed.

It is now accepted that cow's milk is rendered much more digestible by dilution with cereal gruels, partly on account of their mechanical action on the curds and partly on account of their stimulating the digestive process. Oatmeal, barley, wheat or rice may be used in preparing the gruels. Sometimes one agrees better than another. If the plain gruels are used, they must be made quite thin, but if the gruels are dextrinized they should be made quite thick and then dextrinized by the addition of cereo. By this process the starch is rendered soluble, and the amount of proteid in the gruel is about double that in plain gruel. These dextrinized gruels have the same mechanical effect on the curds as the thin plain gruels and add considerable digestible proteid to the diluted milk. The clinical effect of the use of dextrinized gruel as a diluent is best seen in marasmus and subacute gastro-enteric catarrh. Oftentimes infants will take food prepared with this diluent with eagerness and thrive on it when they fail to do well on the same mixture with water diluent. In nearly all cases where milk must be discontinued temporarily, dextrinized gruel will be found useful.

Whey has a value as a temporary substitute for milk, but as a steady diet has the disadvantages of peptonized milk in that it does not develop the motor function of the stomach.

Sterilization and Pasteurization of the infant's food have been strongly advocated on the ground that cow's milk contained innumerable bacteria while breast milk was free from them. Later investigations have shown that it is more the character of the bacteria present than the number, that cause sickness in infants. Baginsky has recently advocated feeding infants buttermilk and has reported 182 cases so fed. In preparing this food a pure culture of lactic acid bacteria was added and allowed to develop lactic acid enough to sour the cream. Bacterial counts of sour cream from which buttermilk is made have shown as high as 1,500,000,000 bacteria per c.c., mostly of the lactic acid class, and yet infants thrive on buttermilk.

The bacteria that produce poisonous products come from filth. These may gain access to the milk, or to the infant's digestive tract in the home, as is shown by infants being attacked who are taking the breast or condensed milk. Much of the ordinary milk supply does not seem to contain harmful bacteria. However, sterilization and Pasteurization have practical advantages in addition to destroying the harmful bacteria that may be present, and will always be necessary in hot weather unless milk quite free from bacteria is obtained and kept on ice until used. In the experiments in curding milk previously mentioned, the milk was slightly acidified *after* the rennet was added and it was the acid that caused the curds of cow's milk to shrink rapidly and become leathery. In hot weather it is difficult to keep the milk or food so that the lactic acid bacteria which are almost always present will not develop some acid. When such food is taken into the stomach the milk quickly curds with rennet, and the lactic bacteria at the body temperature rapidly produce more acid, which causes the curds to contract and toughen. After this contraction has taken place the curds become very indigestible and form a good culture field for any harmful bacteria present in the milk or digestive tract. In buttermilk enough acid has been produced to precipitate the casein, which will not then form a solid clot with rennet. Thus a small quantity of acid toughens the curds while a large quantity prevents their formation.

Pasteurization is useful in hot weather not because it makes the milk more digestible, but because it kills the acid producing bacteria which make the milk curds less digestible.

It should be remembered that Pasteurized milk a day or two old may cause vomiting and diarrhea as a result of the growth of putrefactive bacteria not destroyed.

*Art of Feeding.*—When it comes to the management of a particular case, there should first of all be taken into consideration the intelligence of the mother or nurse and their willingness to carry out instructions.

A child of nervous parents will require a great deal more care and attention to details than a child of laboring parents. The *method* of feeding employed in one case may have to be very different from that of the other; yet the problem is the same in both cases.

When starting a well infant in an intelligent family on artificial feeding, the plan of commencing with diluted top milk as previously mentioned will generally be successful. The increase in the strength of the food should be gradual and the infant should give evidence of being happy and contented, that is, sleep well, have good stools and gain in weight. Regularity in the hours of feeding should be insisted on. If the infant is nervous, efforts should be made

to keep it free from excitement as this will greatly interfere with digestion.

When the use of top milk is out of the question, whole milk may be diluted two to six times and one part of sugar added to 20 parts of food and the mixture Pasteurized or brought to a boil and then cooled. In summer time it may be best not to use top milk for any cases, especially if there is a tendency to vomiting. Where even diluted whole milk cannot be prepared properly, condensed milk is the only thing that can be employed, although it is not the best food from a nutritive standpoint.

Cleanliness of bottles, nipples and everything pertaining to the infant are important factors in successful feeding.

In the management of cases where there is much gastric or intestinal disturbance, much time and patience are required and it may be necessary to see the infant and examine its stools every day. The best plan is to stop all milk food and wash the stomach, as, according to Herter, much of the mucus that is mixed with the fecal matter comes from the stomach. Feed very thin barley water, a teaspoonful of barley flour to the pint, for twenty-four hours or until vomiting ceases. Then increase the strength of the gruel to one to two rounded tablespoonfuls of barley or rice flour to the pint and dextrinize. Keep on this for two or three days and then add *one* teaspoonful of plain or even skimmed milk to a two-ounce feeding; the second day try two teaspoonfuls of milk to two ounce feeding and so increase the amount of milk. Later the top 20 ounces from a quart of milk may be used for diluting and then the top 16 ounces. This will bring up the fats. Sugar should be added cautiously.

If one teaspoonful of plain or skimmed milk to a two ounce feeding is not tolerated the same quantity of condensed milk may be tried. If this succeeds, equal quantities of cream from bottled milk, and condensed milk should be mixed and diluted. The addition of the cream overcomes some of the objections to condensed milk which by itself is a one-sided diet, low in fats and proteids but high in sugars. Whey may be of temporary use in these cases.

A class of cases is seen in which the food is taken with indifference and while fairly well digested, does not seem to build up the infant. In this class of cases the use of mutton or chicken broth, beef juice with dextrinized gruel diluents, or anything that appeals to the appetite is indicated. Efforts should be made to vary the flavor of the food and so arouse interest in the bottle.

Constipation should be overcome by using oatmeal in making the diluent, and by giving well-cooked and strained prunes to increase the intestinal secretion in preference to increasing the quantity of fat so that it acts as a laxative.

Whenever there is a rise of temperature with a diarrhea, castor oil should be given and all milk stopped until temperature and stools are normal, when the feeding may be resumed as mentioned for difficult cases. That a great reduction in the death-rate from diarrheal diseases is possible by this treatment has been conclusively proven by Kerley.

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117 West Eighty-third Street.

## A CASE OF PANOPHTHALMITIS IN TYPHOID FEVER.*

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PANOPHTHALMITIS is an inflammation of all the tissues of the eyeball. It may be caused by infection from without due to penetrating injuries or unsuccessful operations. This is by far the most frequent cause. It may also be produced by infection from within through embolism, septic substances from a focus of suppuration getting into the circulation and becoming arrested in the vessels of the choroid and other diseases. The case reported here is of the latter class.

Panophthalmitis is one of the most painful of eye diseases. Fortunately we do not observe it frequently. In the treatment of 20,000 cases in our eye hospitals about six or eight cases will be seen. Nearly all of these being due to the causes first mentioned. It is well we meet it no more frequently, as it is very destructive to the eye. The sight not only is lost, but also the shape, which results in a shrunken eyeball (Phthisis bulbi). The inflammation may extend to the meninges and brain and produce death. This is a rare occurrence however.

When the inflammation gets well established there is nothing that can be done to save the sight. Panophthalmitis complicating typhoid fever is a very rare occurrence. Less than a dozen cases have been reported.

The patient, a young man thirty-one years of age, entered the medical service of Dr. Van Horn Norrie at the City Hospital, Blackwell's Island, August 25, 1902. I am indebted to Dr. Norrie for his kindness in letting me report this case, and also to his house physician, Dr. H. M. Little, in giving me the full history and temperature chart.

The patient had complained of loss of appetite, pain in the abdomen, vomiting and diarrhea for the two weeks preceding his admission to the hospital. These symptoms continued. The temperature was 103° F., pulse 100 and respiration 28. Examination of the urine showed it to be alkaline. Specific gravity 1.015, and a small amount of al-

* Read before the Society of the Alumni of the City (Charity) Hospital, March 11, 1903.

bumin. The microscope revealed a few hyaline and granular casts. He was fairly well nourished but his cheeks were flushed and the expression apathetic as well as the mucous membranes being pale. The tongue was coated.

The left eye, the one which was subsequently affected by panophthalmitis, had no sight. This was due to an injury received some seventeen years before resulting in an occlusion of the pupil. The diagnosis of typhoid was made.

August 27, two days after admission, a test was made of the blood. It showed Widal's reaction for typhoid in dilution of 1 to 20: leucocyte count 3,000.

August 29. Patient was very delirious during the past night and quite irrational this morning. Leucocyte count to-day, 2,600.

August 31. Abdomen distended and tympanitic.

Sept. 1. Pulse slightly irregular and weak.

Sept. 2. Tympanitis has disappeared. Pulse much improved.

Sept. 5. This is the twenty-sixth day of the disease. To-day the outer part of the conjunctiva of the left eye is somewhat swollen and edematous: no discharge: a saturated solution of boric acid ordered every four hours, and ice applications every other hour to the eye. At five o'clock in the afternoon the eye was much worse. Lids, the upper one especially, very much swollen and edematous, with considerable redness of the skin. The conjunctiva is intensely reddened and likewise very edematous. The cornea dull with a diffused cloudiness. The eyeball is markedly protruded (exophthalmus): no discharge.

Sept. 6. Eye still further protruded and the tension is very much increased.

Sept. 9. The condition of the eye is the same except for a slight mucopurulent discharge. I was called in to-day to see the case and the diagnosis of panophthalmitis was made: patient very weak and unconscious. Treatment changed to hot applications, for fifteen minutes every half hour, to the eye.

Sept. 11. Eye somewhat improved. Discharge increased and more purulent in character. A small opening in the anterior sclera allows the discharge to escape.

Sept. 13. Eye much better; swelling of the lids much less; discharge continues free.

Sept. 16. Swelling of the lids entirely disappeared; eyeball beginning to contract; discharge less.

Sept. 29. Patient sitting up; discharge has stopped.

Oct. 3. Eye much shrunken; treatment discontinued. Eye is now a phthisical one.

In regard to the typhoid condition, the patient ran a regular fever course as the temperature chart will show. The panophthalmitis ran a rapid course. The duration generally being about six weeks to two months, whereas in this case it took only a month.

Fortunately for the patient the disease affected the eye which already was blind, otherwise he would have been in a sad plight. I do not think the injury seventeeen years before had left any condition which would predispose to this disease.

It will be noticed that this complication did not begin until the twenty-sixth day of the fever. By this time the height of the fever had been passed.

The patient was treated by the cold bath method for his fever and was discharged cured from the hospital the last of October.

24 West Fifty-ninth Street.

## MEDICAL PROGRESS.

### SURGERY.

**Diminution of the Sternocricoid Distance.**—In the course of examination of a patient who had twice suffered injury to the cervical portion of the spinal column, with a resulting cervicodorsal kyphosis presumably compensatory to the subluxation or fracture of one of the vertebræ, A. Fasquelle (Rev. de Chir., June 10, 1903) discovered a decided lessening of the distance between the superior border of the sternum and the cricoid cartilage. Inasmuch as radiography throws very little light upon affections of the spinal column, the author believes that measurement of the distance between the cricoid and sternum may be a valuable aid to the diagnosis of fracture, dislocation or sinking of the cervical portion of the spinal column. Out of 100 patients subjected to this test, he found the average space between the inferior border of the cricoid and the top of the sternum to be 45 mm.; whereas in the patient with the abnormal spine, the distance was but 15 mm.

**Adrenalin in Cancer.**—By reason of the vasoconstriction which it effects, adrenalin is capable of modifying the vascularization of cancerous tumors, writes C. Fiesinger (Jour. des Prat., April 25, 1903). In cancer of the rectum, painting twice daily with from 30 to 100 drops of a 1-in-1,000 solution of adrenalin in a tablespoonful of water decreases the accompanying rectitis, may check the discharge and brings about a temporary diminution in the size of the cancerous growth. External, ulcerated cancers become pale, decrease in volume, the hemorrhage may be checked and the progress of the affection is stayed for a time by the use of this remedy. Combined treatment with adrenalin, quinine and beer yeast is, in the author's opinion, distinctly serviceable in the prevention of recurrence after ablation of cancerous tumors. He reports the case of a woman operated upon in 1901 for cancer of the uterus, in whom, the operation being incomplete, a recurrence was expected. During 1901 and 1902 the patient was given quinine hydrochlorate 0.25 in cachet before breakfast and dinner, for five days, and a teaspoonful of beer yeast before meals the next five days; the two remedies being alternated thus for a month, at the end of which time treatment was suspended for five days and resumed in the same order. In 1902, adrenalin was added to the treatment, 5 to 10 drops of the 1-in-1,000 solution being given on rising and retiring the days on which the beer yeast was given. At the present writing, the patient continues to enjoy excellent health. In another case, operated upon three times for cancer of the breast, which recurred very shortly after each operation, this treatment was given, with the result that seven months have elapsed without a reappearance of the cancerous growth.

**Calcareous Osseous Atrophy Following Traumatism.**—The importance of radiographic examination in the study of the remote effects of fractures and contusions is urged by A. Imbert and J. Gagnière (Rev. de

Chir., June 10, 1903) in order that the necessity for therapeutic treatment which would stimulate skeletal nutrition, may not be overlooked, and that the significance of such symptoms as pain, impaired function, etc., may be cleared up. Osseous affections of a certain duration are indicated radiographically by changes in transparency or form of the affected bone, or both. Thus syphilis or tuberculosis of the bone is accompanied by change of form and increased transparency; while in osteomyelitis the opacity of the bone to the X-rays is increased. On the other hand, osseous changes following fracture or even occcasionally traumatism of the soft parts alone, are indicated by increased transparency to the X-rays without change in the form of the bone. This transparency may be uniform or broken by opaque spots. In the authors' experience, there seems to be no relation between the site of the fracture and the resulting osseous atrophy, and of two fractures surgically identical as to site, mechanism of production and displacement of the fragments, one may be followed by osseous atrophy, while the normal mineralization of the bone may be preserved in the other. After compound fractures followed by suppuration, osseous atrophy is usually very pronounced and may extend some distance above and below the fractured point. Osseous atrophy is the rule when, after a simple fracture, consolidation or calcareous infiltration of the callus is retarded. The earliest date at which the existence of calcareous atrophy may be detected by the X-rays is four and a half weeks; and in one of the author's cases, repeated examination with the X-rays failed to reveal osseous atrophy till four months had elapsed.

**Subdiaphragmatic Abscess of the Liver.**—A method by which posterosuperior abscess of the liver may be reached and surgically treated without risk of contamination of the pleural or peritoneal cavities has been devised by P. Mendes (Rev. de Chir., June 10, 1903). He describes the operation as follows: The patient being placed upon the left side, an incision 12 mm. long was made along the ninth rib, starting from its junction with the cartilage. Two incisions, having their origin at the seventh intercostal space, were made to meet the two extremities of the first. The flap thus made was dissected and laid back, the eighth and ninth ribs laid bare, denuded of their periosteum and resected (the former to the extent of 8 cm., the latter 10 cm.) without injury to the pleura. With the finger, the parietal layer of the pleura was then stripped from the ribs below the incision as far as its reflection upon the diaphragm. Then raising, as far as possible, the cul-de-sac of the pleura, an incision was made in the diaphragm which gave egress to 423 gm. of pus. Two large drains were then inserted in the wound, these being removed upon the ninth day, and the wound was completely closed within a month. The author gives to his method the name parapleural transdiaphragmatic.

**A New Process of Exenteratio Bulbi and Ocular Prosthesis.**—The difficulty experienced by oculists in the substitution of a foreign body for the enucleated eyeball is due to the scanty support for such a body, writes A. Ferrar (Gazz. Siciliana di Med. e Chir., May 28, 1903). He describes a method of enucleation and prosthesis which he has successfully used in several cases and which he believes to be free from the objections of other methods. This consists in the preservation of the entire ocular capsule, that is, the cornea and sclera; the contents thereof being emptied through a linear incision of about 2 cm. made in the upper segment of the bulb parallel with its equator and about 4 mm. from the sclerocorneal junction. After the capsule is entirely emptied, the margins of the wound are approximated and sutured; one suture at the center of the wound being left untied so that a small aperture remains for the introduction of the point of a syringe filled with liquid paraffin. The capsule is completely distended with this substance, so that an artificial eyeball is formed, over which may be fitted a glass eye, capable of being moved naturally, owing to the fact that all the muscles are intact and their normal insertions are preserved. To check hemorrhage and avoid the danger of entrance of the paraffin into the central artery of the retina, the author proposes that a few drops of a 1-in-1,000 solution of adrenalin be instilled into the capsule prior to injection of the paraffin.

**Ignition of Ether Vapor by an Electric Light.**—Every surgeon thoroughly appreciates the danger of an open lamp anywhere near ether vapor but it is generally supposed that an electric incandescent light is perfectly harmless. To be sure, accidents from this cause are extremely rare, but D. H. Murray (N. Y. Med. Jour., June 27, 1903) reports an instance in which the ether vapor about a cone by which a patient was being anesthetized was ignited when an electric light was turned on nearby. The patient s hair was badly singed but no serious injury resulted. As there was no exposed fire or blaze in the operating room at the time it was concluded that the ignition resulted from the spark in the electric light, made when the contact took place in turning on the light. It is a possible danger worth remembering.

**Splenectomy and Talma's Operation in Ascites of Malarial Origin.**—Cases of excision of the spleen for various indications are becoming quite frequent, and Roeser in his last work on diseases of the spleen presents statistics of 200 operations. Among the indications we find prolapse of the spleen, rupture, various traumata, wandering spleen, abscesses and various new formations, hemorrhage, enlargement from malaria, splenic anemia, and even leucocytosis, and amyloid degeneration of the organ; finally splenectomy was recommended of late in Banti's disease. Last year Tausini hit upon the original idea of adding to a splenectomy Talma's operation, namely, remove the suspected focus of infection and create lateral paths for the disturbed abdominal circulation. Finkelstein (Roussky Vratch, No. 22, 1903) performed successfully a similarly combined operation for an enlarged spleen with considerable ascites of malarial origin. The patient was a native of a malarial district of Caucasus, with a history of malarial infection of twelve years' duration. For the last thirteen months she began to suffer from a gradually increasing pain and swelling in the left subcostal region; to this were added considerable dyspnea, frequent and severe vomiting, and complete anorexia. The largest circumference of the abdomen was 116 cm. Operation performed three months after admission to the hospital (other measures of treatment having proved ineffective), and proved successful, as the pains disappeared, the abdominal circulation became equalized, and nutrition improved. The author considers as the most important element of the success the performance of Talma's operation whereby collateral circulation was established in the abdomen, and thus an end was put to the severe ascites. Postoperatively it is interesting to note that for the first ten days there was a rise of temperature in the form of a non-intermittent fever, later on this gave way to a series of typical malarial intermittent attacks, which finally yielded to internal administration of arsenic and to hypodermic injections of quinine. The author thinks, together with Michayloosky and Jonnesco, that the extirpation of a "malarial" spleen does not always rid the patient of malaria, and the attacks of malaria are not less severe in patients without spleens than in those with healthy organs. The prognosis of the operation may generally be considered as favorable. Février found out of 86

operated cases of extirpation of malarial non-wandering spleen 17 fatal issues. Out of 16 cases Michaylоosky lost but one, and that was due to an accident (pneumonia with pleurisy). On the other hand, cases of extirpated spleen for other indications run a more favorable course, as when the operation is performed for movable, namely, wandering (floating) spleen, or one that became enlarged because of anemia; in Banti's disease 13 cases of operation gave 3 deaths. It is the opinion of a great number of observers (and among them very many Russians) that the removal of the spleen is not attended by any marked or vital disturbances of nutrition or other functions of the organism. It is doubtless that with more positive and exact indications demanding this operation, a minimum of fatality will be reached.

## PEDIATRICS.

**Feeding of Older Infants.**—From the ages six to twelve months most infants are sufficiently developed to be able to digest cereal foods. Even when a high milk formula cannot be digested it is found that they may thrive on an easily digested and nutritious cereal mixed diet. W. M. HARTSHORN (Med. Rec., June 27, 1903) reports that in the Nursery and Child's Hospital during the past few months all babies over seven months, both artificially fed and nursed, whose digestion seemed able to stand extra feeding, were given some stronger food and it was found that of flaked rice, cream of wheat, oatmeal gruel, farina and bread and milk, the latter proved the most satisfactory. This was prepared from stale bread from twenty-four to forty-eight hours old. The pulp was soaked in boiling water until thoroughly softened and the water was poured off and a cup of milk added. This was then boiled for three or four minutes. After being sweetened and cooked sufficiently it was fed to the baby. At first it is given in teaspoonful doses but later it is increased until they may get from two to three ounces daily in feedings of not more than half an ounce at a time. Older children receive plain bread and milk once daily. In the morning they generally get farina with milk. At noon boiled rice with meat broth poured over it. Fruits are given in season. The weight charts are excellent evidence of the advantage of this extra feeding.

**Examination of Milk by the General Practitioner.**—Milk with an acidity of over two-tenths of one per cent. is not fit for drinking purposes. H. L. K. SHAW (Ann. of Gyn. and Ped., May, 1903) determines this either by a simplified titration method or by alkaline test tablets. The next step is to obtain its specific gravity. The author does this by means of a small Quevenne lactometer constructed with a thermometer. This is graduated from 1.020 to 1.050 and requires a little over half an ounce for a reading. The specific gravity of mother's milk averages 1.030 and is lowered by an increase of fat and raised by a high percentage of proteid. If the specific gravity of cow's milk is less than normal (1.029 at 60° F.), one of two things may be suspected. Either the milk contains an unusual amount of cream or the milk has been watered. If, on the other hand, the specific gravity is higher than normal and the percentage of fat is low, it is fair to assume that the milk has been skimmed. The percentage of fat is obtained in many ways, but the writer prefers the Babcock method. The percentage of sugar varies but little and its estimation is not required in an ordinary examination. The quantitative Fehling test employed in urinalysis may be used for this purpose. The total solids can be determined from the corrected specific gravity and the percentage of fats. The Babcock method consists of dividing the specific gravity of the milk by four and adding to this one-fifth the per cent. of fat. This will give the solids not fat, and adding the per cent. of fat to this product the amount of total solids is obtained. The amount of proteid can be estimated approximately by subtracting the percentages of fats, sugars and salts from the total solids. The Hehner and phloroglucin tests are recommended for the detection of formalin in milk.

## THERAPEUTICS.

**Calcium as a Hemostatic.**—The differences of opinion as to the influence of calcium in increasing the coagulability of the blood seem to have been adjusted by the experimental work of T. SILVESTRI (Gazz. Osped., June 14, 1903), who finds that the influence of the drug depends upon the degree of concentration; large doses retarding coagulation while small doses increase it. In a series of experiments with the blood of sheep and calves it was proven by him that the addition to the blood in vitro of increasing doses of calcium chloride to the limit of 12 mgr., brought about progressive hastening of coagulation and a more retractile clot. Twenty milligrams represented the maximum dose from which coagulation was unchanged and beyond this limit, clotting was retarded. Subcutaneous injection, in a dog, of 40, 55, and 65 c.c. of a one-per-cent. solution of calcium chloride was followed by coagulation of blood, drawn from the femoral vein of the animal, in 15′, while 20, 25 and 30 c.c. induced clotting in 13′. Finally, blood from the cephalic vein of a patient subject to epistaxis was examined; the specimen coagulating in 12′, while administration of calcium hypophosphite per os gm. 7 daily induced coagulation in 9½′ and gm. 4 daily produced clotting in 9′.

**Treatment of Whooping-cough.**—Although this is a self-limited disease and seldom fatal, yet it becomes frequently a very distressing condition and on account of its interference with proper nutrition it demands most serious consideration. T. W. KILMER (N. Y. Med. Jour., June 20, 1903) believes that the medicinal treatment which has proven the most efficacious is that recommended by Dr. C. C. Kerley and consists in the alternate use of an antipyrine mixture and quinine. A child, two years old, is put on the following:

℞ Sodium Bromide..... gr. iij
Antipyrine ..... gr. j
Syr. Ipecac..... ♏ iv
Water .....q.s., ad. ℥i

This constitutes one dose and is given every two hours for three or four days. The child is then given three grains of quinine sulphate every three hours for three or four days and is then put back on the antipyrine mixture. The only drawback is the possibility of upsetting the stomach with the quinine. His greatest success in the treatment of this disease has been obtained, however, by the new application of an old principle by which the spasms are greatly controlled and the vomiting usually entirely eliminated. A stockinette band is placed upon the baby extending from the axillæ to the pubis and fitting snugly. Two shoulder straps are used to prevent the band from slipping down. Upon this stockinette band a single width of elastic bandage is sewn, extending entirely around the body and covering the abdomen. It is sewn on when very slightly on the stretch and if not successful should be drawn a little more snugly. This simple measure will almost always entirely control the vomiting seen especially in nurslings. Such a band, furthermore, when applied around the chest is of marked advantage in aborting the paroxysmal stage and the two bands may thus be combined. The only disadvantage of the method is that in some cases a slight eczema is caused upon the underlying skin, but this readily clears up as soon as the band is removed.

## HISTOLOGY, PATHOLOGY AND BACTERIOLOGY.

**Tuberculous Antitoxin Per Os.**—Following up the work of Italo, who obtained a certain increase in the antitoxic power of the blood-serum of patients by administering to them tuberculous antitoxin by mouth, F. FIZARI (Gazz. Osped., June 14, 1903) sought to determine whether the formed elements of the blood of animals immunized to tuberculosis were endowed with antitoxic properties and whether such elements, given by mouth, could impart resistance to tuberculous toxins. To this end, the clot of blood taken from immunized horses and cows was dried and reduced to powder, and 3 gm. daily administered to rabbits. The agglutinating power of the rabbits' serum was tested before and after a course of treatment with the powder, with the result that a marked increase in agglutinating power was seen after the treatment. As to the increase in antitoxic power, the following results are recorded: After eighty-five days' treatment, the rabbits were injected with mortal doses of tuberculin. Half the animals subjected to such injections lived for thirty-six hours while the control animals survived but twelve to sixteen hours. The remaining number survived and were in good health at the time of writing.

**Callus Formation in the Fractures of Osteomalacia.**—The manner in which the callus is formed in fractures during this disease has rarely been discussed in the literature of the subject and the views of the various authors differ greatly. I. BECKMANN (Deut. Archiv f. klin. Med., Vol. 76, No. 1) publishes two further cases from which some interesting results are drawn. The Roentgen rays were employed in the author's two cases and although the skiagraphs were taken several months after the injury, no signs of any callous formation were in evidence. In one case there was a very faint shadow around a fracture of the bones of the forearm, around which some degree of union seemed to have taken place, but the very slight deposit of lime salts permitted the rays to pass through without interference. In the other case the fragments were not in apposition, and the picture taken five months after the injury, showed absolutely no evidence of repair. The author thinks that the reason that in one case there seemed to be formation of a functional callus, but without the presence of lime-salts, while in the other there were absolutely no traces of a callus, is due to the fact that the osteomalacia in the former case had not advanced as far as in the latter. For it is a well-known fact that the further along the disease is advanced, the less likely is repair apt to take place. These observations also show that the X-rays afford a very effective means of gauging the stage to which the process has advanced, for in the first case the bone presented a spotted or marbled appearance, while in the other nothing could be detected of any bone structure. This may be of great value in doubtful instances.

**Eberth's Bacilli in the Roseola of Typhoid Fever.**—The eruption of typhoid fever is known as one of the important symptoms of the disease. As far back as 1880, Eberth, and after him Koch and Gaffky, found on investigation that the roseola of typhoid fever is the direct result of the poisonous element of the disease. In 1899 Neufeld substantiated the formerly expressed opinions of Neuhaus and Thiemisch, to the effect that the blood of the roseola contained a special kind of bacteria that cause the appearance of the eruption. These spots shelter, as it were, a certain number of viable bacilli which are here protected from the bactericidal power of the circulating blood. The investigations of Neufeld were later on carried out with the same results by Curshman. KAZARINOFF (Roussky Vratch, No. 22, 1903) conducted his experiments on 15 undoubted cases of typhoid fever, among whom 2 had the disease in a recurrent form, and in these the roseolæ were investigated twice. Omitting his methods of examination we can only stop here on the following results obtained by him: In the lymphatic vessels of the excised roseolæ there are found variously grouped a number of closely lying typhoid bacilli; the blood-vessels are free from them; the tissue containing the bacilli is considerably swollen, although not to the dimensions claimed by Fränkel; the number of cells is increased, but not through the addition of white corpuscles. No necrosis of the tissue was anywhere observed by the author. It thus becomes evident that in the eruption of typhoid fever we may see a process depending on inflammation and infiltration of the corium due to the emigration or rather transportation of the typhoid bacilli through the lymphatic vessels. In doubtful cases of febrile disease, when a positive diagnosis can not be established, it may be of some value, as suggested by Curshman, to examine the contents of a roseola, if such be detected.

**Experimental Tuberculosis in the Dog and Resulting Toxemia.**—The course of experimental tuberculosis produced in dogs by endovenous injections of virulent cultures of Koch's bacillus and the toxemia following such injections has been studied by CASAVECCHIA (Gazz. Osped., June 21, 1903). After a varying length of time the animals were killed, and examination revealed entire absence of tuberculous infection of the glands or viscera, save in the lungs, where a miliary bronchopneumonia was found; the bacilli having been arrested in the pulmonary circulation and destroyed, as proven by bacteriological examination. That a grave toxemia resulted from these injections was shown by the condition of the animal shortly after treatment, as well as by the marked increase in the hemolytic power of its serum toward the blood of rabbits, as compared with the hemolytic power shown by the same serum when the animal was in its normal state. In those animals which were allowed to live a greater length of time, a gradual improvement was seen, and examination of the lungs showed regression of the pathological process, from which the author concludes that with the destruction of the bacilli, elaboration of tuberculous toxines ceased, and as a result toxemia was eliminated; a like sequence occurring in those clinical cases which undergo spontaneous cure.

## PHYSIOLOGY.

**Influence of the Contents of the Large Intestine on Strychnine.**—It is known that small quantities of strychnine added to the contents of the cecum and colon of normal rabbits, cannot be detected by Haines' method. In a number of control experiments, however, in which a smaller quantity (1 mg.) was mixed with gastric contents, liver, crushed brains or urine, the strychnine could be detected by the same methods. The conclusion was therefore drawn, that there was some substance present in the colon and cecum of normal rabbits which interfered with the methods of detecting the drug now at our disposal. The same author, W. SALANT (Am. Med., June 27, 1903), has now made some further expirements, and believes that the inability to find the strychnine in the first instance was due, not to anything in the intestinal contents, but to a faulty method. He explains this as follows: The various methods usually employed for the detection of the drug are very elaborate and require numerous manipulations. The solution is subjected to several filterings and reagents, before the alcohol is ready for the final tests. As only small quantities are present, the loss of even a minute portion may influence the result. The success of the same method in separating

strychnine from the mixtures of liver, brains, urine, etc., may be explained by the fact that organic impurities were not so numerous and filtration much better, therefore the manipulations were reduced in number. This may explain why in many cases of strychnine poisoning the alkaloid has not been found. The author outlines a simpler method for making the tests, by which he has succeeded in proving the presence of the drug in the intestinal contents, where the other methods had previously failed.

**Contact-phenomena in Spermatozoa.**—The motion of the spermatozoa in the uterine canal upward toward the openings of the Fallopian tubes, is supposed to be in response to the mechanical stimulus of the cilia lashing in the opposite direction. J. Dewitz (C'blatt f. Physiol., May 23, 1903), who was the first to discover thigmotactic phenomena in the animal kingdom, proves that spermatozoa do respond to contact-stimulation. By suspending minute globules of vaseline in physiological salt solution, and adding to the latter active spermatozoa of the frog, he observed that they moved freely in all directions through the solution, but never through the thin drops of vaseline, moving around or away from them, as if studiously avoiding this kind of medium. This peculiar phenomenon can be explained only on the basis of contact-stimulation.

**The Influence of Alcohol upon Proteid Metabolism.**—That alcohol can be utilized by the organism like fats and carbohydrates, and can exercise the same proteid-sparing power as the latter, has been established by many observers, and is confirmed by the researches of R. Rosemann (Pflüger's Archiv, Vol. 94, Nos. 11 and 12). The latter shows, however, that under certain conditions, alcohol manifests regularly a proteid-destroying power. This is seen in cases not habituated to alcohol, but also in those accustomed to alcohol at the beginning of its administration, and also most probably in cases where the food has a low caloric value. At any rate, this unfavorable action of alcohol on proteid metabolism seems to be, in the majority of cases, a transient phenomenon, for its proteid-sparing power soon appears. This explains the erroneous conclusions drawn from the earlier investigations in this field; the experiments were of such short duration that they only revealed the first stages of the action of alcohol on the transformation of proteids, which in all cases were unfavorable.

**Poikilothermism in Rabies.**—It has for a long time been known, according to J. O. U. Barratt (Jour. of Physiol., June 15, 1903), that in animals suffering from rabies, the body temperature, which is usually described as being slightly raised toward the end of the incubation period, subsequently becomes subnormal. Rabbits at the close of the disease are poikilothermic, the body becoming cold and the rectal temperature during the last twenty-four hours of life being within a few degrees of the room temperature. This phenomenon is to be attributed to a paralysis of the heat-regulating mechanism. During this stage the respiration-rate and the heart-rate are retarded.

**Meat Diet and its Relation to Gout.**—A careful review of the experiments of the earlier investigators in this field, precedes the description of the researches and results of M. Kochmann (Pflüger's Archiv, Vol. 94, Nos. 11 and 12). Pflüger showed in 1900 that an exclusive diet of horse-flesh produced in dogs severe diarrhea. He succeeded in isolating, to a certain extent, the constituent producing this deleterious effect; he found it present in the broth of the meat, could not precipitate it by means of alcohol, but could obtain an ethereal extract. At this time Kionka showed that he could produce a genuine arthritis urica in hens by an exclusive diet of meat lasting for five months. Others before this had produced gout in birds in various ways: Ebstein, by the injection of chromic acid; v. Kossa, by the administration of oxalic acid, phenol, etc. The microscopic changes in the organs of hens made gouty by methods such as those of Kionka, were studied by Bannes, with the following findings: retention of urates in the liver, kidneys, spleen and serous membranes; degenerative processes in the liver, kidneys and spleen; necroses and cloudy swellings of the epithelia of the larger parenchymatous organs; and finally that there is microscopically a difference between gout induced by renal poisons, such as chromic acid, and that induced by an exclusive meat diet. The above results inspired the author to investigate the problem as to whether any pathological changes could be found in mammals after an exclusive diet on meat. The animals experimented on were dogs. Three of these animals after being fed for forty days on meat alone, were killed by opening the carotids and immediately subjected to autopsy. They all showed fatty degeneration of the kidneys and liver, differing qualitatively in each case. The clinical history of these animals was as follows: As regards weight, all three presented marked changes, sometimes increasing, sometimes diminishing, but the end-weight being not very different from the initial-weight. The general condition was always good. The urine sooner or later contained albumin. Although no casts were found, the state of the urine indicated a nephritis. The animals were markedly constipated. The autopsy revealed in all the cases an acute or a subacute nephritis, a cloudy swelling of the liver-parenchyma, and a pigment deposit in the spleen. The author maintains that although he was not able to produce gout in dogs, as Kionka had in hens, yet his results show some analogy to the clinical and pathological manifestations of human gout, and that he has proved a direct relationship between an absolute or almost absolute meat-diet and the etiology of gout. He alludes, in this connection, to the frequency of gout among the beef-eating Englishmen, to the increased elimination of uric acid following a superabundant meat diet, and to the fact that only a part of the uric acid is eliminated through the kidneys. The greater part is destroyed, and according to Wiener, in different animals is destroyed in different parts of the body. In the dog and perhaps also in man, a part of the uric acid is broken up in the liver; in the cow, a portion is destroyed in the kidneys, and in all mammals the muscles take an important part in its destruction. Any degeneration, therefore, of the liver and kidneys would interfere with the destruction of uric acid. Moreover, lack of exercise would impair muscular activity in this direction. The diseased kidneys would at the same time be unable to do their share in the excretion of uric acid, with the result that this substance, accumulating in the body in certain localities, would give rise to the pathological and clinical picture of gout. A further support to this hypothesis is seen in the fact that the uric acid arthritis develops gradually, that degenerations of the liver and kidneys are found in many cases of gout, and that all those influences that would cause degeneration of the kidneys, liver and muscles would favor the appearance of gout. Of these influences may be mentioned a meat diet, either exclusive, or nearly so, chronic alcoholic poisoning, and chronic metal-intoxication, particularly that of lead.

# The Medical News.

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## THE LATEST WORK IN YELLOW FEVER.

It should surely be a source of national pride, when we view the fact, that all of the important discoveries concerning the cause and propagation of yellow fever have been the contributions of American scientists.

Sternberg's initial work upon the cause of this disease first showed that it was not due to a bacterial or vegetable parasite, and his experiments thus cleared the field for subsequent investigations.

The next milestone was reached when Surgeon Carter of the Marine Hospital Service distinctly showed that the disease was not contagious by personal contact, but that the spread of the epidemic depended on "place infection." He also brought forward the distinction between the intrinsic and extrinsic periods of incubation of the disease, which paved the way for the mosquito work of Finlay, Carroll, Reed and Agramonte.

The fact that the mosquito (*Stegomyia fasciata*) transmits the infection of yellow fever is a most valuable addition to our knowledge of the disease from a practical standpoint. It has made the suppression of epidemics a comparatively easy task, and has placed land and maritime quarantine measures upon a practical basis.

The report of Working Party No. 1 of the Yellow Fever Institute of the United States Public Health and Marine Hospital Service, about to be issued, now advances the subject one step higher by clearly showing the phases of development of the parasite causing yellow fever within the body of the intermediate host, *i.e.*, the *Stegomyia fasciata*.

The Working Party consisted of Doctors Parker, Beyer and Pothier, who spent the summer at Vera Cruz, where the prevalence of the disease gave them abundant opportunity for study and painstaking research. They demonstrate, with the utmost clearness, the various phases in the cycle of development of the parasite, from the stomach of the mosquito—which has bitten yellow fever patients—to the salivary gland.

Both the Yellow Fever Institute and the Working Party are to be commended upon the fact that they do *not* claim that the parasite in the *Stegomyia fasciata* is the cause of yellow fever; although from its relation to the disease, and from the fact that the parasite cannot be found in mosquitoes that have bitten other fever cases, the inference is very clear, that the cause of yellow fever in its sexual stage, has at last been discovered in the mosquito host.

The Yellow Fever Institute was founded in 1901, by Surgeon-General Walter Wyman, and its publications and results achieved have clearly justified the thought and work he has devoted to its organization and progress. The object at the Institute is to study yellow fever in all of its phases, until the menacing scourge is thoroughly understood in every detail.

The results of the labors of Doctors Parker, Beyer and Pothier must of course be corroborated, but we feel certain that since they have shown the way, others will have no trouble in attaining the same results. Those who have seen the slides and preparations of the mosquitoes that they have brought from Vera Cruz, are convinced of the importance and correctness of their findings. It now remains to find the parasite in the blood or tissues of human beings.

The conclusions of the Working Party, as given, are as follows: (1) That the bacteriological examinations of the blood of cases of yellow fever during life, and the blood and organs at autopsy, performed immediately after death, in uncomplicated cases, is negative; (2) that *Stegomyia fasciata*, when contaminated by feeding on a case of yellow fever, forty-one and a half hours after the onset of the disease, and subsequently fed on sugar and water for twenty-two days can

produce a severe attack of the disease in a non-immune individual. (3) That *Stegomyia fasciata* contaminated by feeding on a case of yellow fever, and after varying periods killed, sectioned, and appropriately stained, presents with regularity a protozoan parasite, the *Myxococcidium Stegomyiæ*, that can be traced through a cycle of development, from the gamete to the sporozoite. (4) That *Stegomyia fasciata* fed on blood from a case of malarial fever on normal blood, or artificially fed, does not harbor the parasite indicated in conclusion third.

These findings are not only very interesting, but are of the greatest importance in the elucidation of the true nature of the disease; and if they are corroborated by further examinations, and if the parasite is definitely located in the human body, we can feel that the problem of its etiology has been solved and that the epidemics in the future can be easily controlled.

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## WHAT IS GOUT?

"From Sydenham's day to our own—to penetrate no further into the past—we have not failed to talk about gout; how much more do we know of it than we did?" So writes Clifford Allbutt in a charming introductory essay to a discussion on gout in the July number of the *Practitioner*.

There is rich material in this number—T. B. Futcher writes on the "Occurrence of Gout in the United States;" Alexander Crombie, on "Gout in the Tropics," and T. S. Toogood on "Gout as it Occurs Among the Poor." Samuel West treats of the "Relation of Gout to Granular Kidneys and Lead Poisoning." Alexander Haig rides his uric acid theories in discussing the "Causation, Prevention and Treatment." J. Walker Hall writes on "Metabolism in Gout and the needs for combined investigation." "Treatment" is discussed by Sir Dyce Duckworth, Arthur P. Luff and Gilbert A. Bannatyne, while F. J. Poynton reviews the "Recent Literature of Arthritis" and comments thereon.

Futcher shows that for the United States gout is not a common disease, but nevertheless it is not as infrequent as many physicians have been led to suppose. Thus, taking Dr. Osler's words as a basis of comparison, he finds that in the last fourteen years—May 15, 1889, to May 15, 1903—there were 41 cases of gout out of a total of 15,697 admissions or an incidence of .26 per cent., whereas in St. Bartholomew's in London during the same time there were 124 cases admitted in a total of 33,356 admissions, or an average of 0.37 per cent., thus making only one-third more for London. Baltimore, nevertheless, Dr. Futcher writes, has probably more gout than almost any other large city. One of the reasons for the supposed comparative infrequency in the disease, says Dr. Futcher, is the failure on the part of the profession to recognize it. It is to be regretted that Dr. Futcher did not go outside of the Johns Hopkins Hospital for his statistics.

In the tropics Dr. Crombie thinks that the disease is much less frequent, particularly in India, and in other hot climates, than it is in Europe among the same class of patients. It is rarely met with in hospital practice in India.

Poverty being a relative term, Dr. Toogood writes, that it might be better for the gout-stricken subject if he were just the amount poorer necessary to prevent his acquisition of malt liquor. He doubts if the really poor ever develop gout; those with gout among the poor are poor because of their habits. From forty to fifty are the favorite years of incidence, although some patients are but thirty-five years of age when involved. Occupation does not seem to play any rôle, although unaccustomed walking often induces attacks. As to causation, he holds that the consumption of malt liquors is the chief if not the only cause of the production of gout. Wine and rich food are not known among the poor.

It cannot be said that Dr. West's contribution assists us in ascertaining the real relation of gout to lead poisoning.

Dr. Haig still assumes that gout is a uric acid disease, not a "diathesis," but a poisoning; in fact, he is so bound up in his theory as not to see many of the important recent lights shed upon the chemical metabolism of gout by other workers—notably from the continental laboratories. He still believes it a diet disease due to poisoning by flesh and tea. Dr. Toogood tells us the poor have gout from malt liquors and do not know what rich food is like.

Dr. Hall approaches the subject of metabolism in a more modern and, to us, enlightened manner. He takes up, in turn, the metabolism of the various foodstuffs in relation to the disease, devoting particular attention to the nucleins. He points out the futility of coming to conclusions from the work that has thus far been done on gout and suggests the formation of a joint commission to take up the various complicated factors. Isolated work is economic loss and thus far has led to erroneous and one-sided doctrines.

Writing on the subject of diet, Sir Dyce Duckworth says that he does not regard the disease as a purely humoral one but one of neurohumoral pathogeny. If it is necessary for observers to show uric acid poisoning in all cases he says "such pedants will have to wait long if they insist on this evidence."

He is of the opinion that many of the methods of handling gout are founded mainly on the treatment of the supposed causes of the disease and not for the treatment of the patient. Thus the patient is disregarded and everything is seen, as it were, through uric acid spectacles. He ridicules, and justly, we believe, the old saws about red meats being prohibited but that white meats, fish and game are allowed. Beef being condemned and mutton allowed, and a host of other imbecile suggestions that still hang on in fairly reputable text-books on dietetics.

With reference to animal food generally, he says it may be declared not only harmless but beneficial to gouty persons, if taken in moderation. As far as vegetables are concerned, he knows of no reason why any of them should not be taken. Potatoes are not harmful, nor any plant grown under the ground. Alcohol is of great importance he believes. A small amount of good wine once a day will not hurt gouty patients, but most of them drink too much. Malt liquors particularly do harm to this class of patients. The chief feature, however, is to disregard general rules and determine the proper line of diet for each individual patient. Treat him and let the theories go.

Dr. Luff believes in the auto-intoxication theory—"the poisons being possibly the purins and other bodies, but of which we, at the present, know very little"—he thus modestly and wisely puts it. He insists on the irrationality of a routine treatment and outlines the general mode of treatment in acute, chronic and irregular cases, following well-known formulæ and not contributing anything new to our recent text-book methods. He still believes in the use of alkaline salts "for the removal of gouty deposits" but goes back on the much-lauded "lithium" salts. He contributes some new ideas on the preventive treatment of gout, extolling the use of guaiac resins and quinic acid salts.

Dr. Bannatyne praises the uses of baths, and devotes much time to the details of technic. Dr. Poynton closes the discussion with a comment and review on the recent literature of arthritis.

We know of no better summary of our ignorance than in the Notes by the Way of the editor of the *Practitioner* itself: "(1) We do not know how the excess of uratic matter is brought about, whether it is due to increased intake with the food, to increased formation in the body, or to deficient elimination by the excretory organs. (2) We do not know whether the uratic excess is the cause of the phenomena of the disease, or is a mere casual accompaniment of the perverted state of nutrition. (3) Similarly, we do not know in the case of the arthritic attacks whether the deposit of urate of soda is the cause or the effect of the local inflammation."

In all probability gout consists in a defect of metabolism whereby products deprived from cell-nuclei are not properly used up or excreted. These products may arise either from nuclear matter contained in the food, or from the natural wear and tear of tissue-nuclei: they are retained in the system, and a deposit of one of them—sodium biurate—in the joints sets up irritation there, and causes an acute attack of arthritis.

We must not be blind to the fact that in using "that blessed word" metabolism, we mean no more than the chemical side of life itself. All diseases are disorders of metabolism—in other words, perverted vital activity. Hence we practically come back to our original starting point—that gout is a disease which we do not understand.

## THE DANGER OF RAILWAY TRIPS TO HIGH ALTITUDES.

INDUSTRIAL progress creates new medical problems. Year by year the railways reach further and further into the wilderness and creep higher and higher to mountain peaks and valleys. Enterprising hotel managers, following in their sooty train, cap lofty summits with inn and lodge where formerly the lonely eagle perched unmolested. For the majority of people, this reaching out by man into Nature's distant quietudes is of great and distinct good. It takes him from the hum of his fellows to that rest which is essential to life.

But, while the majority of men profit, there is a very distinct, and a large and increasing class to the existence of which attention has, as yet, scarce been called, to whom in these mountain resorts there lurks the Angel of Death.

This is the season, when, from Maine to California practitioners are being called upon for advice as to the choice of regions in which to rest and recuperate from the winter's wrenching vor-

tex of dissipation and of work. The News believes it opportune to urge the possible danger of high mountain travel to all save the healthy and the young.

Physicians who are apt to be called upon to give advice in this matter, cannot do better than to read an article in the *Lancet*, June 20, 1903, by Theodore Zangger, late assistant physician, University Hospital, Zurich, Switzerland. He has, for a number of years, been in the position to observe the effect both of active and passive (railway) mountain climbing in the Alps. He concludes that it is a menace to the lives of elderly persons to ascend beyond 3,300 feet above sea level. Cardiac thrombosis and pulmonic embolism are the accidents to be feared. The seizures do not by any means always take place during the stay on high ground but often come on slowly or abruptly, one, two, or even three days after descent.

There are in this country, as compared with Switzerland, relatively few mountains which are clambered by railways to dangerous altitudes. The roads up Pike's Peak, Mount Washington and the Santa Fé, in New Mexico, as well as some of the transcontinental lines, both here and in British Columbia are exceptions. Outside of these there are, however, a number quite worthy of consideration.

Zangger considers that while under certain conditions 3,300 feet of ascent calls for precaution—in the case of patients with even slight arteriosclerosis the mountain railways up to 7,000 or 10,000 feet are positively dangerous. At this last level there is registered a fall of 200 millimeters in the mercurial barometer. This rarefaction of the air produces an increasing congestion of the pulmonary capillaries which is abetted by the sudden changes of temperature encountered at altitudes. Even when at rest, there is an increase of about 40 per cent. of the respiration volume as compared with the corresponding volume for the same person when on low ground. This in itself is a difficult proposition in the face of any emphysema whatsoever, and is easily seen to imply a marked increase in the work of the right heart. Many persons between fifty-five and seventy years of age consider themselves hale and hearty and are yet the subjects of advanced arteriosclerosis, emphysema and perhaps of cardiorenal involvement.

It may be useful to practitioners to be reminded that in Switzerland alone there are no less than nine railways which creep to an altitude of between 6,000 and 10,000 feet. Who has not heard of the Rigi Culm, 5,900 feet, of the Schynige Platte, 6,660 feet, of Scheideck, 6,470 feet, of Pilatus, 7,000 feet! These are, however all dwarfed into insignificance before the famous line which is being bored through the heart of the Jungfrau. This has, in the past ten days, reached its fourth station, which is at the 10,000-foot plane. It is probable that many American tourists will be unable to resist the delights of this unique journey.

So prominent had these problems become ten years ago that the Swiss Government actually refused to grant a franchise to Guyer-Zeller to build the road in the Jungfrau until scientists had fully considered the question of its relation to the public health. The well-known physiologist, Kronecker, of Berne, became a member of the committee, and its report (1890) was to the effect that it was not desirable to grant the franchise until the company had proved that such ascents could be made without detriment to health. Whereupon Guyer-Zeller immediately arranged, with the aid of forty-two guides, to carry seven people in chairs to the summit of the Breithorn. Kronecker and Sahli, of Berne, made observations on these subjects. Their conclusions were as follows: "Healthy people do not suffer from being conveyed without any exertion on their part to an altitude of some 12,000 feet, but as soon as any, even slight, muscular action is required of them, distressing, or even dangerous symptoms of circulatory trouble supervene." "Reduction of barometric pressure causes dilatation of the right ventricle." So important did the public health considerations seem to Kronecker that he made the following recommendation: "That a physician should be stationed at Scheideck (6,470 feet), who would examine any passengers, at their wish and expense, in order to dissuade them from the trip up the Jungfrau, should they be suffering from any serious affection of the heart or respiratory organs."

It will thus be seen that we have much to learn from the Swiss as to the choice of mountain resorts for a certain distinct class of people. As the honeycombing of mountains and the placing of inns at great altitudes grows more common, the general public, always eager for novelty, will rush to visit them. The course of the profession is clear. Only those travelers who can pass a rigorous cardiovascular examination should be allowed to undertake these delightful but dangerous mountain climbs.

# ECHOES AND NEWS.

## NEW YORK.

**New Health Regulations for Infants.**—The Department of Health has recently issued a circular on how to keep the baby well. The text is here given:

1. *Nurse it:* Nothing equals mother's milk for a baby food. If you cannot nurse the baby use *fresh milk*, which in hot weather has *been boiled* and prepared according to directions. (A circular of directions will be sent on application to the Department of Health). Nurse the baby part of the time, if you cannot nurse it all the time. Do not give it condensed milk or any prepared babies' food.

2. *Feed or nurse it at regular intervals*, not more than once in three hours after it is six weeks old. Don't feed it simply because it cries. Decrease the amount of milk on very hot days. Too much food and too frequent feeding are among the commonest causes of sickness.

3. *Bathe it daily:* The glands of the skin carry off nearly as much poisonous matter as the bowels. They both must be kept open in hot weather. Dry the skin well after bathing.

4. *Air it:* Out-of-door air is necessary. Keep the head shaded from the direct sunlight. In hot weather take the baby out early in the morning before 9 o'clock, when it is cool, and again late in the afternoon and *early* evening, but not late at night.

5. *Keep it cool:* If it is bundled up too much in summer it will become overheated. The more nearly naked it is, the better in extremely hot weather.

6. *Keep it in a quiet place:* A baby's nerves are very sensitive. Continued noise sometimes causes sickness.

7. *Give it water:* Between feedings give water freely, especially in hot weather. Use only water that has been boiled.

8. *Give no fruit* to a baby less than a year old. In summer give no fruit to a baby less than two years old. Fruit kills many babies.

9. *Give no solid food* to a baby less than one year old. For the first year of life the food should be *all milk*. For the second year, *chiefly milk*.

10. Call your own doctor, or if you have none, in summer notify at once the Department of Health if the baby has diarrhea, or is sick, and a doctor will be sent immediately.

11. *When the baby has diarrhea* stop all food and give only barley water until the doctor comes.

12. Use bottled or certified milk; Straus milk, or that prepared and furnished at the various dispensaries (not grocery milk), if you cannot nurse the baby.

**Medal for 20 Years' Hospital Service.**—John S. Langton, orderly and nurse at the Hudson Street Hospital, this city, received recently a gold medal from the Board of Governors and Surgeons of the New York Hospital, of which the Hudson Street Hospital is a branch, as a token of appreciation of twenty years' service.

**Work of the Lying-in Hospital.**—In the month of June the new lying-in hospital at Seventeenth street and Second avenue, this city, has had 434 applicants for treatment, of whom 119 were admitted and cared for in the hospital wards. The number of children born in the hospital during June was 90. For the same period in the outdoor department 266 have applied for assistance in their own homes, and 227 patients were treated in confinement. The number of medical visits made was 925.

**New Harlem Hospital.**—Dr. John W. Brannan, president of the board of trustees of Bellevue and allied hospitals, opened bids last week for the new Harlem Hospital in Lenox avenue, between One Hundred and Thirty-sixth and One Hundred and Thirty-seventh streets. The Board of Estimate appropriated $275,000 for the hospital building proper and $125,000 for the powerhouse and outlying buildings. The lowest bid for the erection of the hospital proper was $307,385, from James McFerran. The Board of Estimate will consider the bids and either reject them all on the ground that they are too high, or make the entire appropriation available for the hospital proper. The new hospital is to be of brick, trimmed with granite, with four-story wings and a five-story administration building.

**New Medical Directory.**—The Medical Directory of the City of New York for the current year has just been issued by the County Medical Society. It gives lists of all physicians in the States of New York, New Jersey, and Connecticut, lists of pharmacies, hospitals, benevolent societies, homes, asylums, and various other data of value.

**Statement by the Mayor of Ithaca.**—The mayor of Ithaca writes to the *Sun:* "Anent the report which appeared in your issue of Thursday, July 16, I would state for the information of the public: First, that the epidemic of last January was over months ago. Secondly, that the 'Ithaca Water Board' organized in April with authority to expend $750,000 for a supply of pure water, is sinking wells to veins at least 280 feet in depth, and more are projected. Thirdly, that wells now flowing aggregate 610,000 gallons per day; an amount which will be greatly increased when pumps are attached. Fourthly, that with a Board of Health of more than usual efficiency, composed of our best citizens, with artesian water largely used for drinking and cooking purposes, together with the fact that no expense has been spared to make this city the cleanest in the United States, gives me warrant for saying no city can be safer as a place of residence or to visit than is Ithaca at this time."

**Man Dies of Glanders.**—James M. Cahill, a fish dealer of Unionport, Westchester, died in the Presbyterian Hospital last Wednesday of glanders. The doctors at that institution say it is the first case that they have ever had.

**As to Insane Criminals.**—An important decision was handed down this week by Justice Lambert of the Supreme Court, Brooklyn, in relation to the incarceration of the criminally insane. The case was on the application of Alexander Gray for his discharge from the Matteawan Asylum. The writ to test the constitutionality of Section 454 of the Code of Civil Procedure, which provides that when the defendant charged with a crime is acquitted by a jury on the ground of insanity the trial court may, if it deem it best for public safety and peace, commit the acquitted defendant to the State asylum until he is discharged as cured. Gray was tried in the Court of General Sessions in New York County for assault in 1901, and acquitted by that jury on the ground of insanity, and the court sent him to Matteawan. Counsel for Gray claimed that the Court of General Sessions had no authority to pass upon the question of Gray's alleged insanity, and that exclusive jurisdiction in such cases is vested in the Supreme Court. Justice Lambert says: "The writ so far as is raised and presented the questions: First, that the Supreme Court has exclusive jurisdiction of insane criminals. The commitment is authority for the detention of the relator only during the period of his insanity. If he has recovered, he is entitled to a discharge."

## PHILADELPHIA.

**Health of the City.**—During the past week there was a decided falling off in the number of cases of contagious diseases. This was especially true of smallpox, there being but 24 new cases as compared with 54 for the previous week. On the other hand, there were more deaths of infants than during any

previous week of the summer. The deaths numbered 130, of which 109 were ascribed to cholera infantum and 21 to marasmus.

**New Hospital Dedicated at Chester.**—The J. Lewis Crozer Hospital at Chester was dedicated on July 17. This hospital is an H-shaped building, 161 feet in extreme length with two wings each 91 feet in length. It contains all the modern improvements of hospitals, including X-ray apparatus and well-equipped pathological and bacteriological laboratories. The surgical operating section is a suite of five rooms.

**Hospital Roof Garden Opened.**—The new roof garden for consumptives at the Philadelphia Hospital was formally opened on July 14 in presence of Mayor Weaver, Director Martin, and many members of the hospital staff. The roof garden is 200 feet long and 30 feet wide. Room will be furnished for from 80 to 100 cots.

**State Board of Health.**—The fifty-fifth meeting of the Pennsylvania State Board of Health was held at Marietta on July 16. Action was taken regarding the pollution of the Schuylkill and other rivers. Reports showed that during the months of May and June there were in the State 1,092 cases of smallpox, with 66 deaths. The Committee on Poisons and Explosives was instructed to prepare the draft of an act to prevent the use of toy pistols by minors. This action was taken because of the many fatal results from the use of those instruments on the Fourth of July.

**Gift for Philadelphia Medico-Chirurgical College.**—By the will of Spencer Morris, formerly professor of medical jurisprudence and toxicology at the Medico-Chirurgical College in Philadelphia, $12,250 is bequeathed to that institution, the income of which is to be awarded annually to the member of the graduating class who receives the highest general average at the final examination for the degree of Doctor of Medicine.

## CHICAGO.

**New Medical Dictionary.**—Dr. Karl von Klein, of this city, is compiling a medical dictionary which will include all medical terms in every language.

**Changes in Illinois Medical College.**—Dr. J. F. Presnell, late surgeon U. S. Volunteers, and Dr. Frank Byrnes, have been elected junior professors of surgery. Dr. Wm. F. Waugh has severed his connection with the college. The new buildings have been completed, one of which is devoted to anatomical laboratories, and the other is to be used as a training school for nurses.

## GENERAL.

**New Army Medical Journal.**—*The Journal of the Royal Army Medical Corps* is the name of a new journal, devoted to medical matters of interest to the British Army. The establishment of this journal has been in contemplation since 1864.

**Appointment of Dr. Eycleshymer.**—The University of St. Louis, which recently purchased the Marion Sims-Beaumont College of Medicine, has appointed Dr. Albert C. Eycleshymer, assistant professor of anatomy in the University of Chicago, as director of its Anatomical Department.

**Educational Bequests.**—The late Mrs. Harriet Lane Johnston, of Washington, has bequeathed $60,000 to the Johns Hopkins University for the establishment of three scholarships. She has also bequeathed $300,000 for the establishment of an Episcopal school at Washington for the maintenance, education and training of choir boys.

**Dr. Albert Appointed.**—Dr. Henry Albert has been elected assistant professor of pathology and bacteriology in the College of Medicine in the University of Iowa.

**"The Law and the Doctor."**—Amid the multiplicity of his daily duties, the physician has but scant time to cultivate more than a passing acquaintance with the collateral branches of his profession; the average practitioner, therefore, knows but little of the legal aspect of his relations to the body politic, or his rights and privileges, or his liabilities and responsibilities to his patients and the community at large. While pursuing "the even tenor" of his professional way, the doctor may suddenly be confronted with a summons and complaint in an action for malpractice, or may be called as an expert witness in a similar suit against a colleague. It is not the intention to urge the physician to become his own lawyer, but he should certainly acquaint himself with the fundamental principles of medical jurisprudence, so that he may be reasonably well prepared to defend his own or his brother physician's rights and privileges on the witness stand. With a view of placing such information at the immediate disposal of the doctor, the Arlington Chemical Co. has arranged to issue under the title "The Law and the Doctor," two 48-page booklets which shall present in condensed form and succinct style, an epitome of the essentially important features of (1) "The Civil Liability of the Physician for Malpractice" and (2) "The Physician as a Witness." These exceedingly practical monographs have been expressly prepared by an eminent member of the New York Bar, who is well recognized by the legal profession as an expert in this special branch of practice. The first of these reference text manuals is now ready for distribution, and after a reasonable interval will be followed by the second monograph. Copies may be had by applying to the above company.

**Yellow Fever Dies Out in Havana.**—Dr. Barnet, the Acting Chief of the Sanitary Department, announces that only three cases of yellow fever have entered Havana harbor this year. Of the three fever-stricken persons, all of whom came from Mexican ports, one died and another was discharged last week as cured. The remaining patient now here came to Havana from Progreso by representing himself as a passenger who had previously registered as an immune. The Government's surgeon at Progreso, Dr. Pla, has been recalled to Havana and probably will be dismissed for relying on a passenger's sworn statement without investigating.

**Sanitation in Manila.**—Surgeon-General O'Reilly has received an interesting report from the medical officers in the Philippines which shows a steady decrease in the death rate of the city of Manila as a result of the operations of the medical officers of the army. The death rate of Manila for the first quarter of the last four years has decreased steadily from 46.80 per thousand of the population for the first quarter of 1900 to 22.17 for the first quarter of 1903. Assistant Surgeon Munson says that the improvement in the conditions this year has been accomplished in spite of the fact that Asiatic cholera and bubonic plague had previously gained a foothold in the islands and that the existence of a largely unvaccinated population in the provinces meant a constant introduction into the city of the infection of smallpox. Cases of plague, cholera, and smallpox have occurred in Manila during the present year, but the precautions taken by the Board of Health have prevented an epidemic therefrom. "The sani-

tary results obtained in the last four years through American control have been accomplished," says Dr. Munson, "despite the naturally insalubrious location of Manila and its total lack of sanitation under the former sovereignty, which from the level site interfering with drainage, the many foul canals ramifying the city, the absence of any sewerage system, and the existence of an impure and insufficient water supply, and many old unhealthful habitations—have created sanitary problems of the greatest difficulty. The Board of Health therefore has been unable to turn previously existing methods and conditions to sanitary advantage, and has found it necessary not only to develop entirely new plans of improvement, but at the same time to combat the results of conditions inherited from the Spanish administration. The mixed character of the inhabitants with their prejudices, superstitions and largely primitive habits of life, also has been a constant obstacle in sanitary work."

**Autopsy of the Pope.**—Dr. Giuseppe Lapponi on July 22 presented to Cardinal Oreglia, Dean of the Sacred College, the official report of the autopsy performed yesterday on the body of Leo XIII. The report is chiefly important as disproving the presence of cancer or nephritis. The text of the report follows:

Yesterday evening, from 4 to 8, the embalming of the body of His Holiness, Leo XIII, took place. We began by injecting into the thigh over five litres of special preserving liquid. Having opened the abdomen, the lower viscera were extracted and were found to be perfectly healthy. The spleen and kidneys were also absolutely normal. In the latter the cortical substance was well preserved and of a pale pink color. After opening the thorax it was found that the heart, the aorta, and the carotid arteries were healthy except that in the arch of the aorta was found an atheromatous excrescence. Nothing unusual was found in the pericardium. The pleura on the left side was quite normal, but on the right side the pleura was full of liquid of an orange yellow color above and bloody at the bottom, with a large clot of fibrin floating. More fibrin was on the free surface of the pleura toward the ribs, with a slight scraping of fibrin easily detached, allowing a view of the serous surface. The upper part of the right lung was quite normal, but the lower part was somewhat hard and cracked at the touch, and while cutting a whitish, frothy liquid oozed out. The inferior lobe had partly adhered to the wall of the thorax, and when this was cut a dirty, white, abundant liquid, without gas, oozed out, showing complete hepatization. Afterward the thorax was filled with medicated cotton and an antiseptic absorbing substance, after which the incision made for the examination was sewn up and the body put in order.

**Obituary.**—Dr. Isaac N. Beegle died Monday in Ocean Grove, N. J., where he had practised as a physician since 1881. He was born in Bordentown, N. J., and was 56 years old.

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**Vesical Infection with Coli Bacillus.**—An unusual complication following surgical intervention is reported by TOLÉDANO (Jour. de Méd. de Paris, June 14, 1903). Following a successful operation for recurring appendicitis, the patient developed, after forty-eight hours of satisfactory progress, fever, dyspnea and retention of urine, the specimen withdrawn by catheter being fetid and of abnormal appearance. Examination of the lungs revealed a congested condition of both organs and examination of the urine showed numerous bacteria, which proved to be coli.

# CORRESPONDENCE.

## OUR VIENNA LETTER.

(From Our Special Correspondent.)

VIENNA, Austria, July 11.

THE NEW VIENNA CHILDREN'S HOSPITAL.

UP to a short time ago Vienna was very insufficiently supplied with children's hospitals. In the year 1900 in all the children's hospitals of Vienna there were only 521 beds, so that, considering the number of Vienna's inhabitants, the proportion is one bed to every 3,107 inhabitants. In Budapest the proportion is 1 to 2,057. It is to be remarked that the better part of the existing hospitals are not at all up to the requirements of modern sanitary conditions, and they are situated at places where the surroundings are everything but favorable.

The new hospital is named the Kaiser Franz Josef Regierungs-Jubiläums-Kinderspital. The hospital owes its existence to the two million crowns fund of the City of Vienna, given in honor of the occasion of the 50-year jubilee of the Kaiser, and to the bequest of George Nellermann, consisting of 600,000 crowns. The government accepted this donation with the condition that it erect a hospital able to accommodate between 180 to 200 patients. The building was finished on August 18, 1902, the birthday of the Emperor Francis Joseph. The new hospital consists of three buildings of the already existing Wilhelminen Hospital, together with 34 pavilions, which can be grouped as follows: (a) Administration buildings; (b) Internal and Surgical Section, with 86 beds, in five buildings; (c) the infected section, with 106 beds, in 23 buildings.

One of the characteristics of the new hospital was to spare neither money nor land in order to apply the most modern achievements of medical science.

The buildings are of five kinds: those with 43, 17, 11, 5 and 2 beds; the latter are the so-called observatory wards for mixed infections or for patients whose diagnosis is not yet established. There are lofty, wide balconies built at the south side of the pavilions, whereon patients can lie in favorable weather.

In every pavilion, besides a tea kitchen, we find a lavatory, baths, closet, and also a complete laboratory, and a so-called prescription room, wherein more accurate examinations, minor operations, etc., can take place.

These pavilions are heated with steam and illuminated by gas and electric lights.

The cost of maintenance per patient is about $1.20.

The Internal Medicine section is under the supervision of Dr. Folsenek, that of surgery under Dr. Friedländer. The surgical compartment is connected with the operating theater through a roofed corridor. The orthopedic gymnasium is also connected with the surgical compartment, and is under the direct supervision of Dr. Lorenz. The nurses at this hospital either belong to or are under the jurisdiction of the sisterhood of the St. Vincent order.

The hospital is under the jurisdiction of a large and competent staff, with Surgeon-in-Chief Pospischil at its head.

# SOCIETY PROCEEDINGS.

## NORTH BRANCH OF THE PHILADELPHIA COUNTY MEDICAL SOCIETY.

*Stated Meeting, held April 13, 1903.*

The President, H. Brooker Mills, M.D., in the Chair.

SYMPOSIUM ON TYPHOID FEVER.

**The Diagnosis of Typhoid Fever With Some of the More Frequent Complications.**—This is the title of Dr. William Egbert Robertson's paper, in which he

called attention to the fact that there was no one symptom which could be relied upon for an absolute diagnosis in these cases, making it necessary to group together a number of symptoms upon which to base an opinion, the time and sequence of their appearance also being considered. Whenever possible, both clinical and laboratory observations should be employed. He believed that if the thermometer were more frequently used in office practice there would be fewer cases of the ambulatory type, as often a slight rise in temperature would put the physician upon his guard sufficiently to suggest rest in bed and other remedial measures at the time he is first consulted. A case was reported of a patient who had visited his physician, complaining of lassitude and inability to concentrate his mind upon his work, at intervals during three weeks, at the end of which time his temperature was taken, and found to be 103° F. He was immediately ordered to bed, but the case terminated fatally in a few days from hemorrhage of the bowels. The second case reported was that of a man who was admitted to the Episcopal Hospital, stating that he had not been well for a month, but continued to work the entire time. While at his bench, he was suddenly taken with cramp-like abdominal pain and immediately sent to the hospital where a diagnosis of perforation was made and an operation being performed was followed by recovery. Reference was made to the fact that, although we know the specific etiological factor that causes typhoid fever, diagnosis by this method is not always possible, even to the laboratory man, and the methods are not usually available to the general practitioner. The antecedent history of the patient, the mode of onset, temperature curve, relation of pulse and temperature, and the presence or absence of spots, are of material aid, but even considering all these symptoms a positive diagnosis is often impossible for several days. Frequently, however, the patient will complain of tiring readily for a few days prior to the attack, pains and aches throughout the body, loss of appetite, coated tongue, possibly slight looseness of the bowels, headache and epistaxis, and while a fictitious diagnostic value should not be placed upon these symptoms, their presence is sufficient in many cases to excite suspicion. The temperature was thought to be the most important early symptom and a careful record thereof during the entire course of the disease was recommended, semi-daily observations being made and recorded by some member of the family, if a trained nurse is not in attendance, careful observation usually revealing the fact that it rises from one to two degrees higher each day than the preceding. Another symptom that should always be considered is the pulse temperature ratio, as cases are frequently observed in which the temperature is as high as 103° F., while the pulse may not be more than 100 to 110, or, in rare instances, as low as 90 or less, and when repeated examinations show a daily increase in temperature without a corresponding increase in the pulse rate, especially when dicrotism is superadded, we have a most valuable symptom. While cases of meningitis often present similar conditions late in the course of the attack, the pulse becomes very rapid. This symptom is enlargement of the spleen which frequently can be discovered on palpation, as early as the end of the first week, and percussion over this region, as well as over the right iliac region will often elicit considerable tenderness. The next symptom is the appearance of the rose spots, which usually occur about the tenth day and last three or four days, upon which too much diagnostic importance should not be placed as they are absent in about 25 per cent. of the cases, and some other conditions present similar spots. Three classes of typical cases were mentioned as presenting more than usual difficulty: (1) The extremely mild cases, in which the duration of the attack is about as usual, but in which only moderate fever exists and the few symptoms arising are trifling in character. The second group are the abortive cases, which often begin rather abruptly and frequently with high fever and very pronounced symptoms for the first two or three weeks, and then go on to recovery. The third class are the ambulatory cases, which at first glance seem to belong to the first group, but were these cases diagnosed and put to bed early in the course of the attack probably fewer fatalities would occur. Rarely, according to Gerhard and Liebermeister especially, afebrile cases may be met with. The author stated that he had seen one which he had placed in that category. The patient had moderate fever, 100½° F., for forty-eight hours, after which it fell to normal and subnormal. Aside from temperature and temperature and pulse ratio these cases run a very benign course. Two types of the disease, both of which are abrupt in their onset, and of which very little mention is made in text-books, are the bilious and the respiratory, the former commences with bilious vomiting and the latter with bronchitis. While these cases are sometimes preceded by chills, they are not so much as formerly, when the antipyretics were more frequently administered for afebrile cases. Age, too, modifies the disease. The Widal reaction can rarely be obtained before the eighth day and, while of value in conjunction with other symptoms, it is not as important as the discoverer claimed. He then went on to say that complications were probably more numerous in this disease than in any other infection, and without mentioning them all he laid especial stress upon hemorrhage and peritonitis, preferring to use the term peritonitis, as other causes than perforation of the bowel not infrequently give rise to it. Speaking of hemorrhage, he said it occurred in about five per cent. of all cases and in from 10 to 20 per cent. of all fatal cases. It varies in amount from a mere trace to copious quantities, and from 1 to 15 or even 20 successive bleedings. A single copious hemorrhage may take place and death ensue, without any external exudence of bleeding. No clinical evidence of the smaller bleedings are elicited. Moderate hemorrhages are sometimes, seemingly at least, accompanied by more or less improvement; large hemorrhages always give rise to more or less collapse. In the great majority of cases pain immediately precedes the accident. Fall in temperature and increase in pulse-rate is also observed. Tenderness, localized or diffuse, more or less meteorism, and if the bleeding has been large, anemia, pinched features, cold extremities and sweating frequently supervene. Occasional rise of temperature, with or without the preceding chill may herald the hemorrhage.

**Perforation.**—Perforation occurs in about two per cent. of all cases, and from 20 per cent. to 30 per cent. of all fatal cases. Peritonitis, therefore, from all causes combined, is the cause of death in about one-third of all fatal cases. Recovery may ensue without operation, as clinical and post-mortem evidences demonstrate, but this seems to be rare, and surgical interference offers the only hope in the majority of cases and must be early to be of any use. Therefore, most minute and painstaking observation is necessary in every case of typhoid. Perforation is almost invariably preceded by bleeding for some hours, and immediately preceded by more or less pain, local or diffuse, and tenderness. Spasm and meteorism rapidly supervene. The absence of meteorism speaks for some other cause than perforation of the bowel; hence careful percussion, especially if the border of liver dulness is indicated. If one waits for indubitable signs of peritonitis, it is too late. Under cocaine an exploratory incision can be made with

impunity, and should never be omitted, where the case justifies the least suspicion. Clinical observation, he insisted, is probably of greater importance than laboratory aid in these cases; at least in the light of our present knowledge, but wherever possible, leucocyte counts, and, in cases of suspected hemorrhage, hemoglobin counts should be made.

**Mild Symptoms Masking Perforation With Peritonitis—Death.**—This was the title of a paper read by Dr. A. B. Hirsh, in which he directed attention to the large number of fatalities occurring in this class of cases, and felt that in view of the obscurity of the cases and the fact that celiotomy, when performed early, saves many patients, all cases of this character should be put on record. He then went on to report the case of a man, aged twenty-seven years, iron-riveter by occupation, of muscular physique, giving a negative family and personal history; he reported having had the appendix removed two years previously for a primary attack of appendicitis. Deafness consequent upon his employment, was added to the mental hebetude usually found in cases of typhoid and increased the difficulty of obtaining subjective symptoms. For two weeks prior to the time he came under observation, he had been suffering from increasing debility, fever, headache, some nose bleeding and nocturnal dreaming, but not vomiting or diarrhea. His temperature was 101.5° F., pulse 90, both of which continued practically unchanged throughout the progress of the disease; apathy was marked; the features were drawn and some emaciation was evident; a few rose spots were found; the abdomen was flat with absence of tympany, gurgling and localized or general tenderness; the liver and spleen were enlarged; constipation was present, necessitating the use of suppositories and enemata; the urine was normal, though diminished in quantity. The Widal reaction was positive. His progress during the first week proved uneventful. Icebag applications and alcohol rubbings were the only drugs administered for the fever, and trional or bromides for sleeplessness. On the seventh day there was a rise in the temperature to 103° F., but this was reduced by the application of the icebag and did not again return. On the morning of the tenth day tenderness in the left inguinal region was first noted, the area of gastric dulness was increasing, and this was followed by rapidly growing and general abdominal tympany; afterward the pulse became small, tense and wiry and very rapid and could scarcely be counted. Although the mental condition was unchanged, there was evidently failure of the vital powers, which forbade operative procedure, which was indicated by the undoubted peritonitis, and death ensued the next morning.

An autopsy upon the above described case was made six hours after death by Dr. H. C. Carpenter, who presented the following report: Body of white man, apparently about thirty years of age; extremely emaciated. Two scars are visible in the right inguinal region, each about two inches in length, one running along the outer edge of the right rectus muscle, with its center about McBurney's point; the other scar is over Poupart's ligament and running parallel with it. On making the incision the abdominal walls are very thin and when the peritoneum is opened a large quantity of gas with a decidedly offensive odor escaped. The pericardium contains slightly more fluid than normal. The heart is normal in size; the left ventricle is contracted; there are no clots, the valves are normal and the heart muscle is in good condition. The lungs are entirely negative; no stasis present. The kidneys are large; the capsule non-adherent and shows a moderate degree of parenchymatous nephritis. When the abdominal contents are exposed, an intense suppurative peritonitis is seen. The omentum covering the viscera extends down into the pelvic cavity where it is bound down by adhesions. That portion of the omentum which occupied the left side of the pelvis was gangrenous. The intestines were matted together with many pockets of pus lying between the coils. The pelvic cavity is full of liquid feces and pus. The last two feet of the ilium is covered with a fibrino-purulent deposit and is very dark in color. A perforation of the ilium is seen, about six inches from the iliocecal valve, the size of a pea, this is at the bottom of an ulcer three-quarters of an inch in diameter. The contents of the ilium are chocolate-covered liquid feces. Very few ulcers are present except in the last foot of the ilium; no ulcers are seen in the colon; the gall-bladder is distended with bile, but there are no gall-stones. The stump of the appendix which remains is not affected. The stomach is greatly distended and firmly adherent to the spleen and surrounding organs. The contents are a dark-brown liquid. No gastritis present. Spleen is moderately enlarged, soft and flabby.

**Treatment of Typhoid Fever Complicated With Indicanuria.**—This paper was read by Dr. Judson Daland, in which he stated that, while he formerly employed the Jaffey test for indican in the urine, he had lately modified his technic in accordance with an article published by Casimir Strzyzowoski, in the *Oesterreichische Chemiker-Zeitung*, for October 15, 1901, in which he gave the following method: "To 20 c.c. of urine of specific gravity of 1.015 (or greater) add 10 c.c. of a 10-per-cent. solution of neutral lead acetate. If specific gravity is less than 1.015, only take 5 c.c. of lead acetate solution and 5 c.c. of water. Filter through a dry filter and take 15 c.c. of a clear filtrate which corresponds to 10 c.c. of the original urine; add one drop of a one-per-cent potassium chlorate solution, then 5 c.c. of chloroform, and lastly 15 c.c. of pure fuming hydrochloric acid (specific gravity 1.19). Mix thoroughly by pouring repeatedly from one test tube into another. In ten minutes the maximum coloration has been reached, and the chloroform will be colored more or less blue according to the amount of indigo set free. Should the chloroform be colored violet by iodine add two drops of a five-per-cent. solution of thiosulphate."

This test, by the substitution of potassium chlorate, does away with the necessity for the chlorinated soda, which it was necessary should always be fresh. The author stated that the occurrence of indicanuria in typhoid was almost always to be found, although there are only certain cases where it is severe enough to demand especial attention. This condition, he stated, is to-day looked upon as being caused by materials putrefied in the intestinal tract; it is not claimed that it is a poisonous substance per se, but that through the absorption of it, other poisonous substances are formed, and we are, therefore, in the habit of looking upon indicanuria as demonstrating auto-intoxication of intestinal origin, and the conditions present in typhoid are those in which we would expect to find indicanuria present quite frequently. The treatment properly resolves itself into treatment for the auto-intoxication, which we are very well able to conduct during the first and second week of the disease, but from the third week until about the twenty-fifth day we are compelled to abandon purgative measures from the danger of perforation, and during which period the intestinal tract should be kept as much at rest as possible. It was stated that putrefying materials in the mouth, thus causing infection of the food, were believed to be a fertile source for this infection, and it was recommended that the mouth be kept in a thoroughly hygienic condition by frequently rinsing out, aided by the application of peroxide of hydrogen, if necessary, and

careful attention to diet. The use of fractional doses of calomel during the first two weeks of the disease, was recommended as an intestinal antiseptic, and it should be employed by placing the powder dry on the tongue, and allowing it to dissolve and slowly find its way into the intestinal tract. The calomel should always be given in combination with some inert substance, such as sugar or milk. The use of this remedy can also be resumed during the last week of the disease, when the danger of perforation is over. Beneficial results are also frequently obtained from the use of one dram of phosphate of sodium dissolved in a glass of hot water and given in the early morning. An occasional enema of normal salt solution at a temperature of 100° F. during the first two weeks of the disease may be valuable in relieving the constipation.

Dr. Anna E. Broomal showed the temperature chart of a case of typhoid fever of sixteen weeks' duration, with a temperature of 106° F. and a pulse of 180°.

Dr. Samuel Wolfe emphasized the value of the use of the thermometer in office practice and urged upon the members to adopt its use more generally, stating that he believed this would be the means of making much more accurate diagnoses. He felt that in the diagnosis of typhoid fever, the combined symptomatology should be considered, while the Widal reaction will undoubtedly occur in cases where the disease has been previously existent, a positive test will add weight to the other signs. Reference was made to the unusually large number of atypical cases which had occurred lately, and the value of a close study of indicanuria in this and other conditions commented upon.

Dr. Mordecai Price urged the use of calomel throughout the entire course of the disease, if indicated, and felt that the fear of perforation should not be allowed to preclude its employment. When there is a rapid pulse, normal or subnormal temperature, drawn facial expression and flabby peritoneum, perforation should be anticipated and operation done at once.

Dr. W. Duffield Robinson referred to a case in which the disease had lasted seventy-nine days with a continuous temperature; after the seventieth day he had begun the use of salol dissolved in white vaseline oil, the oil passed the bowel and was followed in nine days by a normal temperature. A case was reported of a dental student who had an attack of typhoid sometime before the Christmas holidays. On his return after the holidays he was taken with nausea and pain in the abdomen, which three hypodermic injections of morphine failed to relieve, and the next morning he was found to have a typical recurrent attack of typhoid. In the house where he had been taking his meals there were several other students (table boarders), all of whom took the disease, as well as the proprietor and his wife, the proprietor dying in six days after the onset of the condition.

Dr. Samuel P. Gerhard reported a case of typhoid fever complicated by colicystitis, which began in the usual way with headaches and high temperature, the latter symptoms being absent after the first week, at which time the delirium was very great. Calomel being given to relieve the constipation, salivation ensued, but during the fourth week she got up and stated that the abdominal tenderness had disappeared. Suddenly she complained of tenderness in the right side, stating that she felt as though she had eaten something that did not agree with her, based upon which supposition she was prescribed for. The speaker, being called to see her about midnight, found her suffering from intense pain in the right side extending over the back; and examination revealed a large lump on the right side, with perceptible swelling over the right chest. This subsided the next day and she appeared to improve for two or three days, when suddenly the pain returned and the swelling increased very much. Dr. George Ross was called in and obstruction of the bowels with possibly involvement of the gall-bladder suspected; there was no vomiting and the temperature was normal. After this condition had persisted for about a week she was removed to the hospital, and an operation revealed, upon lifting up the right lobe of the liver that the gall-bladder was gangrenous; and upon lifting up the left lobe about a quart of pus flowed out; the gall-bladder was suppurated and contained between 40 to 50 gall-stones. A drainage tube was inserted and the patient is progressing toward recovery, the bile flowing freely and the stools have resumed a normal color, showing that the cystic duct and the gall-duct are all right.

Dr. A. Bernheim recommended that the patient be kept as quiet as possible during the progress of the disease, and felt that it was especially derogatory to have a mirror in the room where the patient could see his own reflection, as it was apt to exaggerate the delirium. In reference to calomel, he stated that salivation had occurred much more frequently when he had used it in fractional doses than when he had employed it in larger quantities.

Dr. Wm. Egbert Robertson, in closing, felt that calomel could be used without detriment throughout the entire course of the disease, and referred to the reports of the Massachusetts Hospital collected by Dr. Fitts, which show that the mortality in this disease has not varied more than 1½ per cent. since 1836; being 11½ per cent. that year and last year it was 10 per cent., calomel being invariably used to the point of salivation in that institution.

Dr. A. Bern Hirsh, in closing, recommended prompt surgical interference in all cases of intestinal perforation and urged upon the members the necessity for careful observation in order to detect this condition. The value of dilute muriatic acid, especially in those cases where there is a furred tongue was commented upon.

Dr. Judson Daland, in closing, felt that the principal reason for the occurrence of salivation following the administration of fractional doses of calomel was the improper condition of the patient's gums, which should be carefully looked after. Muriatic acid was thought to be of value, and can safely be employed with the calomel, provided the two remedies are not given too close together.

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*Stated Meeting, held May 12, 1903.*

The President, H. Brooker Mills, M.D., in the Chair.

SYMPOSIUM ON DYSMENORRHEA.

**The Etiology of Dysmenorrhea.**—Dr. J. Thompson Schell read this paper, in which he stated that the cause of the condition was a much discussed fact and is not established on any distinct scientific basis, dividing the causal factors into three groups: (1) local or pelvic, (2) general or constitutional, and (3) reflex. He stated that any diseased condition of the pelvic organs might be sufficient to cause dysmenorrhea, while on the other hand, apparently normal pelvic organs are found associated with severe dysmenorrhea, and it is not unusual to find all kinds of pelvic lesions, viz., antiflexions, various inflammatory conditions, etc., and no dysmenorrhea. He called attention to the fact that the old theory of mechanical obstruction to the flow is not so widely accepted as formerly, although antiflexion with much angulation is often associated with dysmenorrhea. The normal phenomenon of menstruation is strikingly similar to a pathological inflammation and nature makes provisions for the swelling incident to this phenomenon, but when there is any pathological condition present which would interfere in any way with the normal swelling, pain would naturally result. He believed that gout, rheumatism, anemia, general neurasthenia, etc.,

have all at times a causal relation to dysmenorrhea. The neurotic element is present in all cases, sometimes being the only cause and at all times having some influence on the production of the pain. The relationship between the nasal mucous membrane and the pelvis seems to be proven by the fact that applications of solutions of cocaine to the nose will in some cases relieve the dysmenorrhea and bring about a permanent cure.

**The Medical Treatment of Dysmenorrhea.**—This was the title of a paper read by Dr. Frank C. Hammond, of Philadelphia, in which he stated that in order to rationally treat a patient for dysmenorrhea the cause should first be ascertained; but there is a large class of cases in which the causative pathological conditions cannot be definitely determined. The treatment of dysmenorrhea may be divided into (1) the prevention of the attack, (2) the treatment of the attack, and (3) the treatment between attacks.

1. In cases depending alone upon congestion much good can be accomplished by free purgation the day of or the day previous to the flow. In girls in whom a demonstrable pathological condition cannot be ascertained, and in whom there is a normal anatomic relation of the pelvic organs, the tincture of gelsemium frequently affords the greatest relief; too much praise cannot be bestowed upon this drug when employed in this class of cases. It should be given ten drops three times a day, beginning a week previous to the beginning of the flow. Apiol, cimicifuga and permanganate of potassium are also useful.

2. All cases are benefited by rest during the period, in bed, if necessary; hot vaginal or rectal douches, and a hot water bag over the abdomen. When the pain is of a neuralgic character, antipyrin, gelsemium, cannibis indica, the bromides, caffeine, sodium benzoate, and viburnum prunifolium alone or in suitable combination are indicated. When congestive, with or without malposition of the uterus, free saline purgation, hot douches and hot sitz-baths. In addition to the drugs mentioned, the tincture of piscidia erythrina may be used with advantage, as may also the tincture hydrastis. The routine employment of opium was condemned and it should be employed only as a dernier resort. When the dysmenorrhea is due to vasomotor spasm, one one-hundredth of a grain of nitroglycerin, repeated in an hour, if necessary, will afford immediately relief. This drug is useless if employed otherwise than as herein indicated. The results of nasal therapy in dysmenorrhea, as reported by Flies, Ephraim, Linder and others are detailed.

3. The general health should be promoted by tonics, proper exercise, baths, suitably adjusted clothing, and attention to the bowels. Pelvic congestion should be depleted by local treatment, the use of the tampon, antiseptic and astringent applications, vaginal douching, high rectal injections, pelvic massage, local blood letting, atmocausis and the pessary. Intra-uterine applications are not to be recommended except for membranous dysmenorrhea. In all cases in which there is a demonstrable pelvic lesion, medical treatment is only palliative, surgical measures are necessary to effect a cure.

**The Surgical Treatment of Dysmenorrhea.**—This paper was read by Dr. William E. Parke, in which he divided the cases of dysmenorrhea into two classes: (1) Those curable by dilatation and curettage, and (2) those not amenable to surgical treatment. He divided the case of dysmenorrhea amenable to surgical treatment into (*a*) true obstructive dysmenorrhea; (*b*) membranous dysmenorrhea; (*c*) spasmodic dysmenorrhea; (*d*) congestive dysmenorrhea. The symptoms of true obstructive dysmenorrhea, he stated was a cramp like pain resembling those felt in labor, and may be caused by a new growth following operation, cancer, fibroid, or cicatricial tissue following operation; for the first two causes removal was recommended, while in cancer it is usually too far advanced to permit complete removal and we must usually be content with scraping out the canal. If the condition is due to cicatricial contraction following operation dilatation and curettage should be done, and the same is true if the pain is produced by antiflexion and angulation of the canal. Curettement should be done in all cases as the endometria are nearly always diseased. Membranous dysmenorrhea comes on at the beginning of the period and the pain increases in severity until the membrane is expelled, and wide dilatation, curettement and the application of carbolic acid were recommended. Spasmodic dysmenorrhea is characterized by severe cramp-like pains, usually of short duration, although they may continue sufficiently long to lose this distinction; they may extend over the whole pelvis and may or may not come and go with the menstrual flow. Many of these patients are sterile, recumbent posture gives but little relief, and some cases state that they are relieved themselves by alcohol. He believed that the operation of dilatation and curettage found its greatest field of usefulness in these cases, the reason for this being probably that the internal os in this condition is unusually sensitive and acts as a sphincter, and that forcible dilatation paralyzes the muscular fibers and relieves the spasm. In congestive dysmenorrhea, the pain precedes the flow by some days or a week, and may be simply an exaggeration of the aching that so commonly accompanies menstruation or it may be sufficiently severe to confine the patient to bed. The pain is situated in the pelvic area and does not give rise to the tossing about, fainting or vomiting, being often dependent upon changes in the uterus itself or its appendages, such as chronic metritis or endometritis, retroflexion, fibroid tumors and inflammation or prolapse of the tubes. When the condition is one of congestive dysmenorrhea pure and simple, surgical treatment is not indicated, but when it is secondary to the other conditions indicated, surgical treatment offers practically the only hope of relief. Dilatation and curettement, together with a removal of the appendages, if diseased, or in the case of a retroflexed uterus restoration to its normal position being the operations recommended. When fibroid tumors are the cause, their removal was advised, although dilatation and curettement will often give some relief. He called attention to the fact that there was frequently an association of one or more of the different conditions, and, therefore, care should be taken not to give too favorable a prognosis. He called attention to the fact that ectopic pregnancy was very often mistaken for dysmenorrhea and recommended thorough examination in all cases. If the appendages are diseased dilatation and curettement are contra-indicated unless the diseased appendages are removed simultaneously. He described the technic of the operation and laid especial stress upon the necessity for antiseptic technic in its performance.

Dr. F. Hurst Maier stated that in referring to the case books of the Jefferson and St. Joseph's hospitals, he found that the majority of the cases designated as "antiflexion with dysmenorrhea" occurred in married women and were sterile. He stated that in 135 of the cases the cause was designated as an inflammatory one, either of the uterus, the tubes or the ovarian structures, or in the form of a parametritis or cellulitis, being associated in a certain number of instances with a congenital antiflexion with an elongated cervix and shortened vaginal walls, but he believed that there was no doubt that, in certain classes of cases of dysmenorrhea, at least, the inflammatory condition was the cause of the pain. He believed that the old theory of mechanical obstruction

was entirely done away with and that when the pain is spasmodic we usually find it associated with some pathological condition. He felt that the majority of cases of vascular or nervous origin occurred in young unmarried women and better results would be obtained by vigorous general treatment to build up the nervous system, and their general condition, regulating the bowels, attention to the bladder, occupation, diet, rest and proper remedial agents during the menstrual period. In regard to surgical treatment, in those cases in which there is a distinct pathological lesion, such as fibroids, surgery must be resorted to; in cases of antiflexion of the uterus dilatation and curettage are the operations of choice; while in cases of hypertrophied elongated cervix, with shortening of the anterior vaginal wall, he recommended that the Dudley operation on both the anterior and posterior wall be used to supplement the dilatation and curettement.

Dr. A. B. Hirsh reported three case of pin-hole os cured by dilatation; all three having since married and two of them having borne children with no return of the dysmenorrhea. In each case the pain was absent until one week of the time of menstruation, increasing in severity during that time; in one case becoming so severe as to cause agonizing shrieks. Treatment was directed to the general condition in each case prior to the operation.

Dr. J. Thompson Schell reported a case of appendicular colic associated with dysmenorrhea, in which the dysmenorrhea was cured by the removal of the appendix. While he believed a dilatation of the cervix was of value he felt that we should not be too sanguine of a cure in these cases of pin-hole os, by means of this treatment.

Dr. Frank C. Hammond, in closing the discussion, remarked that he had found hot vaginal douches of value in these cases. He believed that whisky should be employed with caution, owing to the liability of the alcoholic habit being formed. In regard to membranous dysmenorrhea, he believed that pregnancy was as near a cure as could be established, but that it was very difficult for pregnancy to exist under these circumstances.

Dr. William E. Parke, in closing, referred to a number of cases of membranous dysmenorrhea which had come under his observation at the Kensington Hospital, some of which had been cured by the treatment outlined in his paper. While these cases may be relieved for several months, he expressed the opinion that they were rarely permanently cured.

Dr. Anna M. Reynolds reported a case of a monstrosity occurring during a twin pregnancy, exhibiting the specimen.

Dr. E. Franklin Smith, of New York, reported a case which had come under his observation a few years ago, in which the abdominal wall of the child ruptured during delivery; the child was perfectly formed, except the anterior abdominal parietes, which was almost as thin as an egg's membrane, every vestige of muscular fiber from the pubes to the ensiform cartilage and from the median line to the spinal column being missing.

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## HARVARD MEDICAL SOCIETY OF NEW YORK CITY.

*Regular Monthly Meeting, held April 25, 1903.*

The President, Frank H. Daniels, M.D., in the Chair.

**Fusiform Dilatation of the Esophagus Simulating a Diverticulum, with Report of a Case.**—This is the title of the paper of the evening, which was read by Dr. William B. Coley, in which operation was followed by a fatal termination.

**Obstruction of Esophagus.**—The patient was complaining of considerable difficulty in swallowing, so that he had been unable to take food or drink for some time, the condition being complicated by a swelling in the thyroid region and the return of swallowed material unaltered, so that it was evident it had not been in the stomach. The most interesting feature of the case was the occurrence, after the taking of a second glass of liquid, of a growing prominence in the anterior cervical region that made the thyroid project very noticeable. Such swellings have been noted in connection with diverticulum of the esophagus, which occurs by preference in this region, as Dr. Coley showed by the illustration from Nothnagel's monograph on obstruction of the esophagus in his encyclopedia of pathology and therapy.

**Family and Personal History.**—The patient was about forty-five years of age, was born in the United States and says that his mother died with cancer of the uterus. His own first symptoms consisted in inability to swallow meat and bread, the material getting stuck, as he said, in the lower part of the neck. Since that time he has had to be careful to use practically nothing but liquid food. Three years ago he began to notice that a swelling occurred here whenever he swallowed. Usually when the material swallowed was soft he succeeded in getting it down. For the last three months, however, even liquid food has often refused to pass, and, as a result he was losing weight very rapidly. For the last ten days he has been able to take only one soft-boiled egg. Inspection and palpation show a distinct swelling at the right of the thyroid and while the act of swallowing seems easy, this swelling occurs after a glass and a half has been taken and few minutes later the whole quantity is regurgitated evidently without any of it having reached the stomach. The passage of a stomach tube shows that an obstruction exists about 7½ inches from the teeth. After considerable manipulation, however, the tube could be passed on into the stomach. Because of this it was resolved to feed the patient, in order to make his condition better for operation. The food was given by the stomach tube but the patient did not gain very much in weight. It seemed evident that a diverticulum of the esophagus existed at the usual location for such a pathological condition. As is well known this condition is apt to occur in the neighborhood of the cricoid cartilage and it is said to be due to the pressure of precocious bony degeneration of the cricoid ring, producing thinning of the esophageal wall. As the patient was growing weaker in spite of the tubal feeling, operation was decided on after four days, in the hope that the pouch might be removed and the entrance to it closed up so as to give ease in swallowing once more.

**Fatal Termination—Autopsy.**—The dilatation of the esophagus was found to extend very deeply down to the thorax. It was fusiform in character, involving the whole diameter of the esophagus and nothing could be done to relieve it. The patient died on the second day after the operation from congestion of the lungs, which had not gone on to the pneumonic stage. The congestion was thought to be due, to some extent at least, to absorption of thyroid substance, since the most prominent pathological condition found in the thyroid gland, when that gland was exposed, was a large tumor of the right lobe of the thyroid extending down below the sternum and evidently bearing a distinct etiological relation to the obstruction of the esophagus, since its presence must have caused pressure upon the important nerves in this region. The tumor was found to be largely cartilaginous in composition and was very difficult of removal because of the free bleeding from enlarged veins which ensued when its substance was incised. This tumor was evidently of slow growth and, though non-malignant in character, was of the kind that might readily take on malignancy. It had apparently

been growing since the first manifestation of symptoms in the case and the fact that portions of it, were below the sternum made the pressure symptoms produced by it much more serious than would have been the case if the enlargement had occurred in the neck above the sternum.

**Autopsy Findings.**—At the autopsy it was noted that no septic condition was present and the esophagus itself had been very little interfered with. The autopsy showed besides a constriction of the esophagus at the point where the difficulty of swallowing occurred and then a spindle-shaped dilatation of the esophagus reaching down to the cardiac end of the stomach. This dilatation of the esophagus was thought to be due to the pressure of the tumor of the thyroid previously described.

**Diverticula of the Esophagus.**—Modern methods of diagnosis are making it clear that this condition is much more common than has been thought. In 1880 there were only 18 cases in the literature. In 1890 some seventy cases could be collected. Some of the fusiform dilatations of the esophagus reported have been very pronounced. Rokitansky described a case in which the esophagus was as large as the arm of a patient. The common symptom of these cases is the feeling of the patient that food never reaches their stomach. At times, besides the dilatation of the esophagus, there is a lengthening of it, which causes it to assume something of a serpentine form. Dilatations are usually due to spasm of the cardiac orifice with secondary relaxation of the muscle above. Sometimes these dilatations occur as the result of even functional or so-called hysterical spasm of the esophagus. The mechanism of their production in these cases is not easy to understand.

**Incidence of Diverticula.**—Diverticula of the esophagus are likely to occur in either sex and have been reported at all ages from twenty to extreme old age, though the symptoms are commonest in the two decades between twenty and forty. The prognosis of the condition is very unfavorable, since, after a time, most of the food finds its way into the diverticulum and is vomited thence without serving in any way for the nutrition of the patient. Death from inanition is almost the rule in unoperated cases and is apt to be slow and painful. Operation is not as unfavorable as might be expected and in recent years the proportion of recoveries has been constantly growing in the hands of good surgeons. Operation should be suggested, however, before the patient has become exhausted by the condition.

**Radical Operation.**—Dr. Maurice H. Richardson, of Boston, has recently reported some cases in which he has succeeded in extirpating the diverticulum closing the opening into the esophagus and bringing about a complete cure of the pathological condition. In the literature there are some 56 cases reported, 17 of which have been operated upon with only one death. Diverticula are often spoken of as pressure diverticula, especially when they occur in the upper part of the esophagus and it is a very curious observation that in most of the cases no stricture is found to account for the beginning of the diverticula pouch. It is not always easy to decide what is the source of the pressure that leads to the weakening of the esophageal walls. In the present case the fusiform dilatation of the esophagus was evidently due to the pressure of the thyroid tumor.

**Similar Case.**—Dr. Palmer Cole said that he had recently had experience with a case having many of the features of the case described by Dr. Coley. The patient is a young man of twenty who came to Dr. Cole's office in a state of extreme distress with a very anxious face, blue hands and lips and clammy coldness of the extremities and complained that he was choking. He had the feeling of a lump in his throat which made it impossible for him to swallow and he frequently put his finger to his collar, as if to relieve some constriction. He had taken no solid food for two years. On the morning before his visit to Dr. Cole's office he had swallowed some dry cracker, but had not succeeded in getting it down. To this he attributed his exhausted condition. Dr. Cole exerted a gentle pressure upon the tumor present in the cervical region and after a time massage seemed to give some relief. The patient was given ten grains of carbonate of ammonium as a temporary stimulant and this seemed to get to the stomach without difficulty. In order to carry out the massage Dr. Cole had to get his fingers deep down under the sternum and this seemed to relieve the condition as if something had been dislodged.

Dr. H. S. Spooner, in discussing the case, said that just above the spasm of the esophagus hypertrophy of the muscular walls occurs and this is apt to be followed by dilatation. If the dilatation occurs more in one part than in another, that is, if there is a localized weakening of the muscles, a diverticulum results. If not, then a more or less regular dilatation occurs.

**Difficulty of Diagnosis.**—Dr. Walsh said that he had seen a case of functional stricture of the esophagus in Professor Nothnagel's clinic, which illustrated very well the difficulty of diagnosis in these cases. For several years a young man had had a series of attacks of difficulty of swallowing. For days at a time he would not be able to get anything into his stomach, even with the greatest effort. Usually after the passage of a sound he secured control over his swallowing mechanism, until some emotional strain or overwork or worry made him liable to have this spasmodic constriction of the esophagus once more. Professor Nothnagel was of the opinion that the recurrence of these spasmodic constrictions might ultimately lead to the production of a diverticulum of the esophagus. There seemed to be absolutely no reason for the recurring spasm, except the intensely neurotic condition of the patient, who had a family history with nervous tendencies on both sides. Dr. Walsh said that on the other hand the recognition of malignant stricture was not always easy since it ran a more or less latent course until serious narrowing of the lumen of the esophagus had been brought about. In some patients very little complaint was made until actual impossibility of swallowing solid food developed. In a case seen in Vienna the man had found difficulty in swallowing solid food only for a few days when somebody suggested that such difficulties of swallowing might be overcome by taking a quantity of pepper seeds in a glass of beer. This was followed by complete inability to swallow anything, even liquid, and the sounds could not find any passage into the stomach. At the autopsy it was found that the pepper seeds, about the size of peas, had lodged in a tortuous canal which represented the lumen of the esophagus through a rather long malignant growth of that organ. Their presence had given rise to some edema which absolutely closed esophageal opening and made even the passage of liquid impossible. The case illustrates the possibility of latency in malignant cases until serious conditions may follow attempts at swallowing solid food and when the diagnosis from the suddenness of the attack and the absence of previous history may lead to a suspicion of the functional character of the affection.

Dr. Coley in closing the discussion, said that in these cases it is often a mystery how the stomach tube passes, yet, after the swallowing of even a few drops of liquid, reflex spasm occurs with complete closure of the esophagus. It is curious that sufficient hypertrophy of the muscles of the esophagus above a functional constriction does not occur to enable the esophagus to pass on the food in spite of the resistance. Curiously, however,

little hypertrophy of the esophageal muscles is found at the autopsy of these cases, as a rule.

**Hodgkin's Disease Relieved by X-rays.**—Dr. Coley reported a case of advanced Hodgkin's disease, in which a great improvement of symptoms with reduction in the size of glandular swelling occurred as a consequence of repeated exposure to the X-rays. The patient was a man of forty-five years who noticed four months ago that the glands on the side of his neck were becoming enlarged. After these his axillary glands then his inguinal glands became involved. Then he lost considerably in weight. His spleen reached within a couple of inches of the opposite anterior superior spine and in its lowest portion was down almost to the pubis. The blood count showed the presence of 70,000 leucocytes with a number of red cells distinctly below normal. The X-rays were employed as a last resort, though without much hope. Exposures were made of the enlarged glands in the neck and axilla for some ten minutes at a time, four times a week. He began to improve at once. Within two weeks the spleen was distinctly smaller, the glandular swellings had gone down on the sides and the number of leucocytes was markedly reduced. After six weeks of treatment the leucocytes came down to 12,000 and the spleen was reduced to less than one-fourth its original size. Now practically all the glandular enlargements are gone and the man has gone back to his work. He considers himself entirely cured.

**Ultimate Prognosis.**—The ultimate prognosis in cases that are relieved by exposure to the X-rays is not as good as might be anticipated from the prompt improvement which takes place and the amelioration of the general condition which follows. Dr. Williams, of Boston, who has large experience in X-ray work, reports some cases of Hodgkin's disease in which prompt improvement took place, yet the affection recurred and ultimately with fatal termination. Dr. Senn, of Chicago, reports two cases entirely cured by the X-rays, but the time since the relief of symptoms is not long enough to be definitely assured against return. Dr. Senn inclines to the opinion that Hodgkin's disease is due to an acute infection. There are some who consider that the enlarged glands are really the result of a generalized glandular tuberculosis. Tuberculous inoculations were made into guinea-pigs, but the animals disappeared just about the time autopsies were to be made—stolen from the laboratory, it would appear—and so the result was not known.

**Continuous Ether Apparatus.**—Dr. H. S. Spooner described an apparatus for the giving of ether continuously during mouth operations in such a way as to avoid interference with the operator by the presence of a cone or other large inhaling apparatus. The tube through which the ether is given is fastened in the angle of the mouth and the ether flow is regulated by means of valves. No special irritation of the mucous membrane takes place and the operative work may be continued without any attention to the anesthesia, which can be made as deep and long-continued as is necessary.

**Spindle-cell Sarcoma and X-rays.**—Dr. Coley described a case of a woman, who came from Boston in the spring of 1901, suffering with a large tumor in the right iliac fossa. This was entirely too large to permit any hope of radical removal and extended up as high as the umbilicus. It had been growing larger and harder for some time when the patient came to be treated by the mixed toxins of erysipelas and the *Bacillus prodigiosus* with the hope of possible relief. Under the repeated injection of the toxins the tumor began to decrease in size, but after some time the decrease stopped and it remained at a standstill. Even this was a distinct improvement over the condition of rapid growth that had been the rule before. After a time, however, the toxins evidently lost their influence and the tumor began to increase in size again. The abdomen became as large as that of a woman in the eighth month of pregnancy and the general health became very unsatisfactory. The case seemed utterly hopeless and the patient herself had given up all prospects of relief.

**Immediate Improvement Under X-rays.**—As a last resort the X-rays were tried and, after a time, improvement began once more. There were periods of fever evidently due to the absorption of septic material from the broken-down tumor which was disintegrating under the influence of the X-rays. After three months of treatment she was so much improved that she began her occupation of teacher once more in the fall, and went to Boston only on Friday, Saturday and Sunday for treatment. She has now become practically well and the tumor has entirely disappeared. She is an intelligent person and describes very clearly just how the series of changes took place which brought about the disappearance of the tumor. After exposure to the X-rays she would note a spot of the tumor sorer and tenderer than the rest and then it would become distinctly less hard. After a time a hollow would form at this point, showing that there had been absorption of material and this hollow would increase in size by absorption from its edges. During this process of absorption fever always occurred, but this subsided of itself after a time.

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## THE MEDICAL ASSOCIATION OF THE GREATER CITY OF NEW YORK.

*Stated Meeting, held at the New York Academy of Medicine, May 11, 1903.*

The Vice-President, Ransford E. Van Gieson, M.D., in the Chair.

**Experimental Researches on Resuscitation After Death from Chloroform.**—This was the title of a paper by Drs. Robert Coleman Kemp and A. W. Gardner, which was read by Dr. Kemp. In addition to reporting a series of experiments conducted by the authors, it was proposed to describe a simpler and what was believed to be a safer method of massage of the heart than that which was first credited to Prus, and to call attention to certain facts in attempted resuscitation from anesthetics, drowning and allied conditions, which might possibly be of practical benefit. The general method of preparing the animal to be experimented upon was described, after which it was stated that in some cases respiratory tracings were taken by means of a compression bulb held in position by a band strapped about the chest. No further respiratory tracings were taken after the operation of opening the chest was begun. In some of the animals only cardiac tracings were taken but careful note was made above these the instant respiration ceased. In others no tracings were taken, but the following important facts were noted: The time of cessation of heart and respiration; the period when the partial movements of the heart ceased, after the thorax was opened; the length of time thereafter that massage of the heart was begun; the time the heart began to beat alone.

In some cases, when the heart seemed flabby and empty and did not react to massage, a small infusion of normal saline solution at 120° F. was given, as an additional stimulant, and also to furnish fluid to work upon. When the heart seemed dilated and full of blood, this was unnecessary. After resuscitation such an infusion, given before removing the animal from the Nélaton to the dorsal position, in order to prevent shock, was found extremely efficacious. Artificial respiration was continued until the wound in the chest

was closed for the purpose of preventing collapse of the lung. In all cases, after the chest was opened, the heart was allowed to come to an *absolute standstill*, without the slightest movement of any description, even partial, being perceptible from sight, feeling or compression. A period of three, five, ten, and, in one case, nearly sixteen minutes was allowed to elapse before massage of the heart was begun. (The tracings were demonstrated, and accurate figures given.) As to the mode of death from chloroform inhalation, in most of the cases respiratory failure occurred first, followed by heart failure. In several instances, however, heart and respiration failed synchronously. In one case the heart failed as if it had been pierced.

**The Limitations of the Usual Methods of Resuscitation Demonstrated by the Kemp-Gardner Experiments.**—A careful study of these demonstrated the following facts: The chloroform was pushed to the point of complete respiratory and cardiac failure. The heart-beat could not be detected, the pulse could not be felt, nor could pulsation be obtained in the carotid and femoral arteries, which were previously dissected out, the one for attachment of the manometer, the other for infusion into the vein. The animal, clinically, is apparently dead; yet even at this stage the manometer tracings demonstrate an occasionally and scarcely appreciable cardiac beat. Physiologically, death has not occurred; and, in fact, not clinically, for even in this extreme condition the animal can still be resuscitated by the usual methods—infusion with hot normal saline solution, inversion, artificial respiration, hypodermics, etc. If, however, no effort at resuscitation is made, the manometer tracings finally cease absolutely, and the animal, according to the physiologist, is at last dead. If the thoracic cavity be now opened and the heart carefully examined, it will be noted that though the organ in its entirety has absolutely ceased to beat, yet for a time (several minutes in many instances) there is a partial muscular contraction occurring occasionally in one or both ventricles, which, however, is so slight and incomplete as to produce no trace by the manometer. Even at this stage the usual methods of resuscitation will restore the animal in some cases. Finally, and in the last stage, the heart becomes absolutely motionless and inert, to sight, touch and compression. Though the vital spark exists, as may be demonstrated by the radical method of restoration, yet the animal may be considered as *dead*, since the usual methods of resuscitation at this point absolutely fail. Some *vis a tergo* agency is positively essential to start up the heart action, and it is, moreover, necessary that this should be quite vigorously applied. It is this indication that cardiac massage, and that alone, fulfils, for it must be remembered that there results from its employment not simply the interesting experiment of the return of heart-beat for a period of time, but an actual restoration of all the bodily and mental functions.

**Results of Cardiac Massage.**—From the standpoint of the clinician, the authors believe that in certain cases cardiac massage is of practical utility, and that, so far, it can be replaced by no known method. They succeeded in resuscitating 11 out of 23 animals (dogs) after absolute cessation of heart-action to sight, touch and compression of the organ, and that, too, after it had remained in this condition for variable periods without any efforts at resuscitation. In nine of the animals the functions of intelligence, drinking, urination, defecation, etc., were restored to normal. In many of the animals under experimentation, artificial respiration, inversion, infusion with hot normal saline solution, etc., were tried, with resulting failure until cardiac massage was added to the treatment.

**Methods of Massage.**—The method usually advocated consists in the resection of several ribs, the insertion of the hand into the left pleural cavity, and rapid manual compression of the heart. In the experiments several methods were tried, including the above. Some successful cases were secured by each, but one of these was found to be far safer and more rational than the others. This was described as follows: The animal is placed in Nélaton's position, which throws the heart forward against the chest and somewhat upward. An incision is made over or slightly below the apex, and, if necessary to secure more space, a small piece of the fifth and sixth ribs may be resected. The index and middle fingers are passed over the margin of the heart and behind it, near the apex, and pressure is made on the heart against the chest. Or, the opening being enlarged, the fingers may be placed behind, and the thumb between the apex and chest-wall, and the heart is then rapidly squeezed between them. It was found that a rapid intermittent (double action) pressure was the most successful in causing resuscitation, and this, in effect, imitates the dicrotism of the pulse, as is shown in the tracings. A rapid single action pressure was not so efficacious. In the operation upon the thorax it was found to be the best method to make an oval skin-flap, and, reflecting this forward, to open the thorax about the middle of the base of the flap. In some cases, during the compression of the heart, a small amount of hot normal saline solution (at 120° F.) was poured on the heart, through the thoracic wound, in order to prevent chilling of the organ. It is also well to wrap the animal in hot towels for the same reason.

After the heart has begun to beat alone the chest wound is rapidly sutured. As it was found that the manipulation in the chest might have a tendency to cause exudation, in most cases a strand of sterile gauze was inserted through a small counter-opening, for drainage, at the base of the flap. In order to keep the lungs well filled with air, artificial respiration was invariably kept up until the thoracic wound was closed. Before removing the animal from the Nélaton position an infusion of normal solution (4 to 6 fluid ounces at 120° F.) was given, to prevent shock. The manometer was then disconnected, the carotid artery and femoral vein tied off, and the external wounds sutured. The animal was removed to a box, wrapped in cloths, and given a hypodermic of morphine to quiet him. The dogs lived from two to twenty-four hours, and most of them became active and hard to control. The autopsies demonstrated in some cases that they had torn out sutures, with resulting pulmonary collapse and secondary hemorrhage. Some cases were infected through their own efforts, and some undoubtedly through the operators' hurried and insufficient attention to absolute antiseptic details. None of the cases in which the last method was employed showed any damage to the heart or pericardium. With a more perfect technic there seemed to be no reason why death should occur at all.

**Hoyt's Pump for Artificial Respiration.**—This instrument was devised for the authors by Mr. J. T. Hoyt, electrical expert to the physiological laboratory of the Medical Department of Columbia University. It is furnished with entrance and exit valves at the base, and by means of a V-attachment, oxygen and air can be administered in combination. It can be clamped to a table, and is readily taken apart. An improvised filter for the air can be attached, or a simple method devised to carry the air through gauze impregnated with an anesthetic, so that an operation on the lung can be carried on and collapse of the organ prevented. Each full stroke of the piston represents 22 cubic inches

of air, the normal inspiration being about 20 cubic inches in the adult. By means of a small governing-rod to regulate the height of the stroke (markings being placed on the rod), the piston-stroke can be made to correspond with the amount of air required to inflate the infant or child. This portable pump was believed to be extremely useful in resuscitation in cases of collapse on the operating table, in drowning, in gas or opium poisoning, and in respiratory failure in the newborn. (Dr. Kemp demonstrated the use of the pump on the body of a large dog.)

**The Kemp-Gardner Intubation Tube for Artificial Respiration.**—This has proved eminently successful for intubation of animals. It is practically an O'Dwyer tube with a hollow handle. The part entering the larynx, however, is somewhat shorter, while the distance between the bulbous enlargement which rests on the vocal cords and the curvature at the base of the tongue is slightly longer, to allow for the extended position of the head when the patient is inverted. There is a small opening in the upper surface of the tube which, by means of the thumb, can be regulated as an expiration valve. This tube is believed to be much less liable to damage the soft parts (larynx and cords) than the Fell-O'Dwyer tube. The authors consider that intubation of the larynx is the only accurate method to secure perfectly satisfactory artificial respiration. There can be no question that in a large percentage of cases artificial respiration is improperly performed.

**Infusion.**—Heat, as a cardiac stimulant, is one of the most important factors, and the temperature of normal saline solution, as Dawbarn has demonstrated, should be 120° F. This solution actually reaches the heart at about 110° F. If a higher temperature is employed (125° to 130° F.), some crenation of the red blood corpuscles occurs. When there are commencing signs of shock, a preventive infusion should be given. If this fails, a slow infusion of 1½ liters, continuously trickling into the vessel at a temperature of 120° F. for forty-five minutes, may be efficacious.

**Complete Inversion of the Patient; Nelaton's Position.**—The importance of complete inversion cannot be overestimated. The semi-oblique or oblique position is not sufficient. Dawbarn advises hooking the legs at the knee-joint over the edge of the table, and this might be employed with advantage in drowning cases, artificial respiration being performed while the patient is inverted. This would seem to be more efficient in clearing the chest and larynx than by the present methods in the practically dorsal position, and is undoubtedly more serviceable in stimulating the heart. In one of the experiments severe pulmonary edema was caused by too rapid infusion. By complete inversion of the dog, accompanied by artificial respiration, it was possible to pump out the lungs, the fluid flowing copiously from the animal's mouth.

**Cardiac Massage Performed in the Human Subject.**—In the summer of 1901, Dr. Kemp made use of this procedure in the case of a young girl who died suddenly from shock after a simple operation for opening an accumulation of pus in the left side of the abdomen, in which nitrous oxide gas was the anesthetic employed. The father gave permission to try massage of the heart, and the method described was adopted, but without success. The case was in every respect a most unfavorable one, as the patient was pyemic, and, in addition, weakened by several previous operations. In conclusion, the conviction was expressed that massage of the heart was both sound therapeutics and a perfectly justifiable measure in all cases of death from chloroform or any other anesthetic, as well as from drowning and allied conditions, when all other means of resuscitation have failed.

**Simply an Arrest of Function.**—Dr. William H. Thomson thought the importance of this matter could hardly be overestimated. In the experiments described by Dr. Kemp it would be difficult to call in question the main facts of the condition; for all intents and purposes the dogs were actually dead. But although they were dead, the mechanism of life was still intact. It was a characteristic of deaths from drowning and anesthetics that the mechanism was not all affected; there was simply an arrest of function, and therefore for a time there was a possibility of resuscitating the patient. It had occurred to him, however, as to the application of these experimental researches, that possibly what might be true for even the higher animals might not be true for man. The human heart, it was well known, was much more subject to shock. Still, he spoke only on a priori grounds, and the practical utility of the procedure described in the paper could be determined alone by actual experience.

**Might Not Time be Saved by Approaching the Heart from the Abdomen?**—Dr. R. T. Morris said it had occurred to him that perhaps a little time might be saved if the heart were approached from the abdominal cavity. In that case no time would be lost in resecting the ribs, and moreover many of the instances in which cardiac massage might be called for occurred during operations in the abdomen when that cavity was already opened.

**Let the Lungs Collapse.**—As to the maintenance of artificial respiration, while the chest was being opened, in order to keep the lungs filled with air, he thought it was a question whether this was not a mistake. Collapse of the lung was only a trifling matter. The artificial production of this condition was an excellent resource for the arrest of hemoptysis. He would, therefore, suggest that the lungs should be allowed to collapse until the operation was concluded. There would be no difficulty in getting them back to their normal condition afterward. In lung surgery one great trouble often was to keep the lungs collapsed, and nitrogen was almost the only thing that would do this.

**Whisky and Morphine Before the Use of Anesthetics.**—Dr. R. H. M. Dawbarn said it seemed not creditable to the profession that such wide differences of opinion should still exist as to certain points regarding both prevention and treatment. As to the former, with hardly any exceptions in twenty-two years' experience he had used a very small dose of morphine, guarded by atrophine, subcutaneously, and a large dose of whisky by the mouth, an hour before operating, and had never yet had cause to doubt its wisdom for several reasons. This was the rule also, he thought, among surgeons in this city.

**Alcohol Unjustifiable in the Treatment of Anesthesia Narcosis.**—As to the treatment, we see to this day a patient, with death already impending, commonly receiving alcohol in large amounts by the needle, a practice radically different from its use in *prevention*. According to Prof. N. C. Wood, this is little better than murder, for we are then treating by a narcotic drug a patient already too deeply narcotized.

**Means of Resuscitation.**—To speak of ways of undoubted value, whether the respiratory center or the heart be at fault, Dr. Dawbarn said he would advise a prompt inversion by aid of the knees hooked over the table, artificial respiration by the rapidly repeated compression of the chest wall, and very hot salt water (120 to 125° F.) poured freely into the rectum. Nélaton's position is of the utmost value in stimulating the heart by distending the right chambers by weight of blood. Of course, not a drop of blood between the feet and heart can reach the brain except by being pumped through the heart. As to the proper degree of heat,

whether by rectum or intravenous introduction, he worked this out in the Columbia Physiological Laboratory in 1890 to 1891 by aid of the kymograph and manometer, and Dr. Kemp has verified his results, then published. Although it must be seldom indeed that such a measure as cardiac massage will be needed, we owe Dr. Kemp much appreciation for putting this measure upon much firmer and more scientific grounds than was ever before the case. After the demonstration which had been given this evening, he thought no surgeon could be said to have done his whole duty in a case of anesthesia narcosis, where other means have failed, until he had resorted to massage of the heart. As to Dr. Morris's suggestion to open the abdominal cavity in order to save the time consumed in cutting away the ribs, there was no necessity whatever for such a resection, as the operation could be satisfactorily performed without this.

**Opening the Chest for Hemoptysis.**—As to opening the chest for the treatment of hemoptysis, he would consider such a procedure reckless in the extreme.

**The Treatment of Chloroform Syncope.**—Dr. Thomas L. Bennett said that in chloroform syncope the main dependence must be placed on mechanical means. Personally he had been invariably successful with the method advocated by Maas, which consists of the application of forcible compression of the chest over the heart sufficient to create an artificial carotid pulse, the compressions being made at the rate of 120 per minute. Inversion he believed to be unphilosophical and fraught with danger. As to the hypodermatic injection of drugs, this was practically useless in such an emergency, as they could not be absorbed until the crisis was passed and the patient on the road to recovery. In any case, where all other means had failed, he would not hesitate to resort to cardiac massage, and he believed that this procedure would prove of great value.

**The Routine Use of Morphine and Whisky to be Condemned.**—As to the routine use of morphine before giving an anesthetic, he was absolutely opposed to the practice. The narcotic effect of the drug often seemed to be doubled under these circumstances, and, besides, the patient might have an idiosyncrasy which would render it highly dangerous. He was also strongly opposed to giving whisky by the mouth, especially because it tended to promote vomiting. If alcohol were employed at all, it should be given by the rectum.

**Reply to Criticisms.**—Dr. Kemp said that while there might be some differences between the human heart and that of the dog, the similarity was sufficient, he thought, to justify the opening of the thorax and performance of cardiac massage in any patient in whose case the ordinary means of resuscitation had failed. In regard to Dr. Morris's suggestion, it seemed to him that as abdominal operations themselves were a frequent cause of shock, it would not be a very wise policy to open the abdominal cavity when the patient was already prostrated with shock. As to collapse of the lungs, he believed it was positively necessary to prevent this on account of the special relations which these organs bore to the heart, and that the maintenance of artificial respiration was therefore an important part of the procedure. In many cases of anesthesia syncope artificial respiration was of itself sufficient to restore the action of the heart. Collapse of the lungs was consequently a real danger. He was sorry to disagree with Dr. Bennett in regard to the question of inversion of the patient. It was a well-known fact that there is no better stimulus to the medullary centers, both cardiac and respiratory, than an increased blood supply, and the inverted position tended to promote this. If the patient was in a condition to respond to such stimulus, this of itself might start up heart-action.

## THE NEW YORK ACADEMY OF MEDICINE.

### SECTION ON GENITO-URINARY SURGERY.

*Stated Meeting, held May 20, 1903.*

John Van der Poel, M.D., Chairman.

**The Choice of Technic in Operating Upon Prostatic Obstruction.**—Dr. Chas. H. Chetwood read this paper, which will appear in a subsequent issue of the MEDICAL NEWS.

**Personal Results Obtained by the Bottini Operation.**—Dr. Willy Meyer, of New York, read this paper, and drew the following conclusions: (1) The operations making a direct attack upon the enlarged prostate gland were preferable to those aiming to exert an indirect influence. A direct attack should first be made in the case of every patient asking for relief. This failing, an operation on the testicles or vas deferens might then be resorted to: (2) Two useful operations were had for the direct treatment of the enlarged prostate, *i.e.*, prostatectomy and galvanocaustic prostatotomy (Bottini's operation); (3) In selecting the method indicated in any given case, one must individualize and be guided by anatomical, pathological and social conditions; (4) Prostatectomy was, of course, the most radical and most surgical procedure; it should be the operation of choice whenever promising success; (5) Perineal prostatectomy offered advantages over the suprapubic method, since it enabled the operator to do the operation under the direct guidance of his eyes. (6) Debilitated patients who seemed unfit subjects for the more radical operation should not be relegated to catheter life, nor should prostatectomy be done to "let them down easy;" they should be advised to have Bottini's operation performed. (7) Surgeons should familiarize themselves with both methods in order to be in a position to do justice to their patients. (8) It was the duty of those refusing to do Bottini's operation under any circumstances, to nevertheless advise patients who asked for more radical relief to have Bottini's operation done, if the operation with the knife seemed contraindicated. (9) The records of 59 patients upon whom he had operated, ranging in age from forty-seven to eighty-two years of age, 7 of whom died, either directly or indirectly from the operation, while 52 had recovered to a greater or less extent, were instructive. Much could be learned from these carefully elaborated statistics and further carefully compiled statistics as to the late results of both operative procedures—preferably in the hands of one man—were desirable in that they would increase our knowledge with reference to the selection of the proper method in the individual case.

Dr. Parker Syms said that the Bottini operation had always appeared to him to be a thoroughly unsurgical procedure and notwithstanding the claims made for it as regards its safety, he claimed it to be far more dangerous than the perineal prostatectomy and, at the same time, an operation which was not radical, inasmuch as it would only afford permanent relief to a few or small percentage of the cases. Years ago the profession came to the definite and proper conclusion that internal urethrotomy could not safely be applied to the deeper portions of the urethra. Certainly if that is true it is still more true that the electrocautery incision of the prostatic urethra, if done at all, should not be done by the internal method and, therefore, the speaker felt that the operation presented to the profession by Chetwood was far safer than that of Bottini. Dr. Syms claimed that prostatectomy done entirely through the perineum by the straight median incision was the safest means of affording definite relief to these sufferers. His own experience embraced 25 cases with but one death and he felt that, by his method of operating, any hypertro-

phied prostate could be removed through the simple median incision. In speaking of the mortality in the treatment of prostatic obstruction he made the statement that in those who had come to catheter life on account of this prostatic obstruction and acccompanied by cystitis, the mortality was 100 per cent. unless they were relieved by radical operation. With reference to the enucleation of the prostate he referred to his twenty-third case as an extreme example of celerity. This was a patient who had suffered from stone and who was in a very feeble condition and would not have been operated upon had he not required relief from this stone. He performed a perineal incision, exposed the prostatic urethra and apex of the prostate, opened the membranous urethra and, through that opening, performed a litholapaxy. Finally the anesthetizer suggested that the operation should be terminated quickly as the man's condition was failing. He then proceeded to enucleate the prostate at once and he was informed by one of the spectators that an absolute enucleation of the prostate in this case was accomplished in 45 seconds. He said that the operation ordinarily required from 30 to 45 minutes. In conclusion, he wished to pay a tribute to the admirable and unselfish work of Dr. Willy Meyer, who had made such unprejudiced investigations as to the merits of the Bottini operation. He felt that the medical profession was indebted to Dr. Willy Meyer for the results shown, though he always felt that the results showed the operation to be a dangerous and uncertain procedure.

Dr. Howard Lilienthal said that in dealing with hypertrophied prostates "doctors disagreed" and that in reply to the query "Who should decide?" he believed each doctor should decide for each case. Undoubtedly good results had been obtained by various methods and he believed that when a surgeon has been fortunate in the employment of one method and has become skilful in one particular operation, he was likely to continue employing that method or operation. It seemed to him that Dr. Sims took rather a narrow view when he insisted that *perineal* prostatectomy was the only form of prostatectomy to be employed. He agreed with Dr. Syms in believing that the operation of prostatotomy was not, as a rule, one to be recommended in all cases of prostatic enlargement. He believed, however, that in retention due to fibrous ring-like obstruction, in which hypertrophy plays no true part, prostatotomy might be employed with benefit. Dr. Lilienthal said he had had excellent results from suprapubic prostatectomy but he would be willing in proper cases to give the perineal method a trial. He asked Dr. Willy Meyer why he believed that section of, or injury to, the ejaculatory ducts caused impotence? It was his opinion, based upon clinical observation, that section of the ejaculatory ducts might cause sterility but did not cause impotence. Dr. Lilienthal said he had operated upon 14* cases, by the suprapubic method and had succeeded in curing 13 of the patients, so that they urinated normally and could completely empty the bladder. Some of the patients had suffered from stone and many from cystitis before the operation. One patient, himself a physician, had been operated upon one year before by the Bottini method with only temporary relief. When he first came under the speaker's observation there was complete retention and constant leakage. It was thought possible that the symptoms might be due to locomotor ataxia from which the patient suffered, this opinion having been given by a leading neurologist. On opening the bladder it was found that a median pedunculated lobe had been sagittally split into two equal parts by the Bottini incisor and these two parts fell together over the internal orifice of the urethra causing as complete retention as if they still consisted of one piece. This man made a perfect recovery and when Dr. Lilienthal saw him a few days ago he could completely empty his bladder and voided limpid normal urine. Suprapubic prostatectomy could be performed with great rapidity and the entire operation finished in from twelve to thirty minutes. Usually not a single vessel has to be tied, no vascular structures being divided. The incision was made in the median line through the linea alba and then into the bladder previously distended with air. In his later operations Dr. Lilienthal had avoided the use of counter-drainage in the perineum and he believed that this counter-drainage, in the presence of good siphon drainage from the suprapubic wound, was unnecessary and even harmful. The patient who died was uremic, partly aphasic before the operation, and this operation was done for complete retention. He believed that, in this case, it would have been wiser to have been satisfied with suprapubic drainage until the patient's general condition should have been improved when a prostatectomy would have been probably fraught with less danger.

Dr. James Pedersen said that recent literature showed some desertion from the Bottini operation in favor of prostatectomy, and a tendency to favor perineal prostatectomy as opposed to suprapubic. He inclined to the belief that, taking all operators and all cases into account, the Bottini operation was less serious than prostatectomy. He thought that an effort should be made to classify cases, and to regard some as better suited for prostatectomy than for the Bottini operation. In this the cystoscope is of the greatest help. He was inclined to favor freer drainage of the bladder in some cases after the Bottini operation than can be obtained by an inlying catheter of usual caliber, and therefore approved of Dr. Chetwood's perineal galvanocautery prostatotomy. He is convinced that certain cases could be greatly benefited, if not cured, by the Bottini operation, which certainly would not survive a prostatectomy.

Dr. Joseph Wiener, Jr., said that he had fortunately been able to see most of the cases operated on by Dr. Lilienthal, and had been persuaded by the good results obtained, to perform suprapubic prostatectomy in his own cases. Not only was the mortality low, only four per cent., but the patients that had survived the operation had all been absolutely cured. In not one of the cases was there pain or residual urine present after the wound had healed. Dr. Wiener emphasized the fact that if some of the previous speakers had seen the remarkable results attained by the suprapubic operation, they could not have made some of their statements. The statement had been made that prostatectomy should only be done when promising success. Suprapubic prostatectomy promised success in 96 per cent. of unselected cases. Moreover, the statement that debilitated subjects should not have a prostatectomy done was not borne out by experience. Dr. Wiener had performed suprapubic prostatectomy in a man of eighty-two years, and the patient had made a perfect recovery. Moreover, he had recently performed the operation, with gratifying results, under laughing gas anesthesia. The former of these operations had been done in fourteen minutes, and the latter in eleven minutes. Comparing the results of suprapubic prostatectomy with those of the galvanocaustic operations, the doctor said that he could not see why the latter operations, which in many cases were merely palliative, should be done, when the mortality following them was much higher than that following prostatectomy. In comparing the suprapubic operation with the perineal, the doctor said that he favored the suprapubic on account of the better exposure, and

* Dr. Lilienthal regrets to note an error in the figures originally given, namely, 23 cases. The error was a clerical one and was due to certain cases of malignant and suppurative disease having been counted in.

more especially on account of the rapidity with which it could be done. Dr. Parker Syms had said that it took from thirty to forty-five minutes to do the perineal prostatectomy. The suprapubic operation could always be done in one-half, and often in one-third of that time. Moreover, Dr. Wiener had been enabled to perform suprapubic prostatectomy without the use of ether or chloroform, and that, in old subjects, was surely a decided advantage.

Dr. Chetwood said there was nothing else for him to add, unless it was to reiterate the facts he had already brought out. He would dissent from the suggestion that the galvano-cautery operation was in anywise a palliative measure. It had been demonstrated in many of his cases that its effect was most radical. When several patients—not one case—who had been suffering from chronic pyelonephritis of an advanced type were operated upon by the method in question, the obstruction in the bladder relieved and complete abatement of the pyelitis followed, such a result could not be looked upon as palliative, but was most radical. When a large number of cases of complete and incomplete retention of urine, operated upon by the same method, were able to dispense with the use of the catheter and were relieved entirely of their retention, such a result could hardly be called palliative. He would not pretend to say that prostatectomy was not the operation of choice in some instances; but that there were many cases unsuited for this operation—cases of bar formation, of hard, fibrous enlargements, which could not be enucleated, that were better attacked by means of the galvano-cautery—could not be denied. He said that the reports heard, which gave so low a mortality, were very impressive, but could not be accepted as final in face of the incontestable statistics of other well known operators. There was one cause of death which always was a possibility, no matter how skilful the operator or how short the operation; and that was pulmonary or cardiac embolism, the chances of which were certainly much greater where glandular tissue was removed. He had seen a number of such cases. He felt that he could take to himself a part of the credit of the success of the evening, although he had personally contributed the least share toward it; as, on the invitation of the President, he had dictated the subject discussed, and it had been on this account that the President had extended the invitations to the gentlemen who had read papers and participated in the discussion.

Dr. Willy Meyer thanked Dr. Syms for his words and said that he had purposely followed up the Bottini operation tenaciously for five years to the exclusion of all other methods in order to find out *by personal experience* whether it had a place in the radical treatment of prostatic hypertrophy or not. As the result of such an experience he came to the conclusion that it had. He said that as much as he agreed with him that deaths that followed any operation should be counted as deaths due to that operation, still he could not do so in glancing over his own cases. Thus, if a patient, who had been operated upon by the Bottini method, developed for some unknown reason an acute phlebitis of the left saphenous vein and after having been thoroughly relieved from urinary retention died after a while from a pneumonia which, though no post mortem was made, was thought to be embolic, it would have been unjust toward the Bottini operation to count that case as one due to the interference as such. Further, if, in testing the Bottini operation, one tried to find out the best method of procedure for using spinal anesthesia with a sterilized solution of tropacocaine and the patient immediately after the injection and before the operation as such had been finished, showed symptoms of general interference with his well-being and died within the next few days with the same symptoms, it was also unjust to attribute such a death to the Bottini operation as such.

With regard to the question of radical relief of the prostatic trouble by means of galvano-caustic prostatotomy he said, that he had presented several patients to the New York Surgical Society and to other medical gatherings, to prove the effectiveness of this method of treatment. A number of patients thus operated upon had had no pain in urinating, emptied their bladders four or five times in twenty-four hours, and had less than one to two ounces of residual urine. In fact they felt perfectly well and cured. Therefore, he believed, it was absolutely incorrect to call the Bottini operation a palliative procedure as had been done by Dr. Wiener. He said that it was true that, in a number of cases, the operation would not cure but bring relief only, but this was not the fault of the operation but of the operator. As had been mentioned in the paper, Bottini's operation was a very difficult procedure with reference to carrying it out *properly* in a given case. Just as well the operation of litholapaxy might be termed a palliative operation because sometimes splinters of stone remain between the rugæ, were detected by the cystoscope later, and then crushed again or washed out at another séance. And yet, he said, litholapaxy was the operation of choice in operations for stone in the bladder. Of course it was much simpler for the surgeon to do a cutting operation and be able to immediately arrange it so, that the after-treatment can be taken care of by an assistant; but he said every surgeon would occasionally meet with patients in whom prostatectomy was absolutely contra-indicated. He knew there were colleagues who would refuse to recognize any procedure but prostatectomy. They would condemn such poor sufferers to the continual use of the catheter if they would not deem prostatectomy advisable, because, they say, there be no other choice for them. Whereas, he who knew that there is another operative procedure besides prostatectomy, viz., Bottini's operation, can probably help, nay even cure such an unfortunate patient. Surely only those who have done Bottini's operation only once or twice or not at all are the ones who condemn it.

Dr. Meyer said that so far he had not performed the modification of the Bottini operation, as proposed by Dr. Chetwood. Perhaps he was too conservative. But just as much as we were doing litholapaxy by introducing a lithotrite through the entire length of the urethra galvano-caustic prostatotomy could be successfully done in this way. He said it was true that in a few instances perineal section had become necessary later, because the galvanocautery knife had entered into the membranous urethra causing a periurethral abscess. Of course, such abscesses were not likely to develop if perineal drainage had been primarily established. However, if such an accident had occurred incision can be made in time and further injury be prevented. In many cases of large prostatic growths a finger of the usual size will not succeed in palpating very thoroughly the configuration of the gland, thus helping one in determining what should best be done for the patient at the moment. So far as drainage was concerned he was satisfied that a permanent catheter of from 15 to 19 French gauge induced through the entire length of the urethra was almost always well borne and necessary, sometimes for a number of weeks. He said that perhaps he might change his opinion regarding the modification of the original Bottini method as time advanced and that certainly Chetwood's results were gratifying and corroborated what he had said before, *i.e.*, that the Bottini operation could *not* be called a palliative procedure. He said that what would be necessary in the future would be to learn by careful analysis of every case how to indi-

vidualize in proposing operations and find out what was best to adopt in a given case. Before closing his remarks, Dr. Meyer asked that permission be given him to illustrate what he meant to say by a few cases as follows:

*Case I.*—A patient came from out of town; he had to work hard. He came under the speaker's care with an enlarged prostate associated with stone, and it was necessary to cure him, if possible, in one sitting. He had a very pronounced emphysema and chronic bronchitis. He did a perineal prostatectomy, removing the stone through the same incision, under spinal anesthesia with perfect success.

*Case II.*—Another patient in the sixties was brought to his office on account of prostatic trouble and with the statement that he and his wife were absolutely opposed to any cutting operation and that the patient was willing to continue the catheter throughout the remainder of his life if nothing else was feasible. He proposed the Bottini operation which he performed soon after. About ten weeks later, upon inquiring regarding the patient's condition the latter wrote him (he being a German), "I am famous" (famos). The catheter had been laid aside.

*Case III.*—A gentleman who had mining interests in the West and who traveled a great deal and who felt that he could not always have a doctor's help when needed, wanted the most radical work done. Perineal prostatectomy was proposed, accepted and performed. He now had not a drop of residual urine; now and then there was some little dribbling during night. He had some contraction at the neck of the bladder which was overcome by sounding.

*Case IV.*—Another patient in his sixties had a large amount of residual urine due to an enlarged prostate. Prostatectomy was proposed and accepted. Before operation a general examination of the patient revealed a pronounced valvular disease of the heart, so much so that after consultation general anesthesia as well as spinal anasthesia seemed contra-indicated. Inasmuch as the Bottini operation can be and ought to be carried out under local anesthesia that operation was proposed and done with much benefit to the patient.

*Case V.*—A patient, eighty-two years old, was brought to him suffering from far advanced paralysis agitans, with contracted hip-joints and absolute retention. His widowed daughter had been taught how to catheterize her father as the people were too poor to afford the continuous services of a trained male attendant. After months of faithful work the daughter had broken down and then the question came up as to what could be done for the patient. As a matter of course he was opposed to performing the Bottini operation on this patient. But the relatives insisted upon more than palliative work, being willing to take any risk. Thus Dr. Meyer reluctantly, in the summer of 1902, did a Bottini operation on this patient. A very troublesome after-treatment followed. The result was that the patient got rid of his catheter absolutely and has but very little trouble with his urinary organs. He said that truly a great boon had been conferred upon the patient and the entire family by having done Bottini's operation. The poor old man could now at least die in peace.

What the doctor wanted to bring out in writing his paper, was: *not* to discuss the uniformly recognized value of the two excellent cutting operations for prostatic enlargement, suprapubic as well as perineal, but to prove by his personal experience in 59 patients that, in especially selected cases, where prostatectomy by either route is contra-indicated or refused by the patient or his relatives, the Bottini operation must be proposed, inasmuch as it too could not only bring relief but perfect cure of the prostatic trouble.

## NEW YORK PATHOLOGICAL SOCIETY.

*Stated Meeting, held May 23, 1903.*

The President, James Ewing, M.D., in the Chair.

**The Dysentery Bacillus in a Series of Cases of Infantile Diarrhea.**—Dr. Martha Wollstein read a paper on the results obtained from the examination of the stools of 114 cases for the bacillus of dysentery. The technic used was that recommended by Dr. Flexner and his pupils. The stools were obtained as fresh as possible. Where blood and mucus were present some was carefully taken on a sterile swab or platinum loop and suspended in natural broth of peptone water. From this suspension agar plates were poured at once or within an hour. Duval found that the dysentery bacillus grew more profusely on agar that is slightly acid in reaction and throughout this work such a medium was used. After the plates had been in the thermostat for twenty-four hours a number of glucose agar tubes were inoculated from them, and twenty-four hours later the gas-producing organisms were rejected. From the tubes without gas, transplants were made to plain acid agar, and then the bacilli were tested as to their reaction with serum from a horse immunized with the Flexner Manila organism.

Stools from healthy infants were examined in ten cases and dysentery bacilli were found. The stools from ten newly-born infants were also examined during a period of from twelve hours to eight days after birth. In no instance was the dysentery bacillus present. Of the 114 cases studied, the dysentery bacillus was found in 39. The ages of the children varied from five weeks to four years. The character of the stools varied greatly; blood was present in 20, usually as small specks mixed with or streaking the mucus. Many stools consisted entirely of blood and mucus. In five cases tenesmus was marked. Of the fatal cases the greater number died during the first or early in the second week. Only three lived for four weeks or more. The bacillus isolated was a short, non-motile rod with rounded ends, sometimes almost coccoid in form, growing singly or in pairs. Two cultures formed a thin pellicle in broth after five days, comparable to that described by Hiss in the case of his Bacillus "Y." Indol was formed in dextrose-free broth after three to seven days. One bacillus formed no indol and did not ferment mannite, maltose or raffinose. All the 38 other forms formed acid in the presence of mannite, raffinose, and maltose, as well as levulose, galactose and glucose. The agglutination reactions were fairly uniform and the bacilli reacted with a serum prepared from the Flexner Manila bacillus in dilutions of 1 to 50 up to 1 to 3,000; and with a serum prepared from the Shiga bacillus up to 1 to 200 only. Blood reactions were somewhat irregular. They were absent altogether in 12 cases. In six others the blood could not be obtained. In 14 good reactions were obtained. In seven cases the reaction was present only after the injection of antidysenteric sera, the blood having been negative before that time. The reactions were made with the bacilli obtained from the case, and with the stock "Harris" and "Shiga" cultures. No reaction was obtained in the blood in any case with the Shiga organism. One hour was the time limit used. The *Bacillus dysenteriæ* was not found in the heart's blood or in any viscus in five cases examined post mortem. A septicemia due to the *Bacillus dysenteriæ* seemed to be of rare occurrence.

In conclusion the speaker summed up as follows: Cases of infection with the dysentery bacillus in infants tend toward the clinical picture of dysentery, with frequent mucous and bloody stools. In some cases of hospital infection, occurring as terminal to other diseases (especially pneumonia) and in other mild cases,

the stools may never contain blood, but mucus is present in every case and usually in large amount. The serum reaction is uncertain during the first week, frequently negative after the sixth day, but may be absent for two weeks. It cannot be relied upon for early diagnostic purposes in infants and young children. The isolation of the *Bacillus dysenteriæ* from the stools is the only positive evidence of infection during life. The bacilli are present in the stools for a period of two to three weeks, but may remain for a longer time. The type of the organism almost invariably found in New York is that of the "Harris Manila" or Flexner bacillus.

**The Pathological Anatomy of a Series of Cases of Infantile Diarrhea in Which the Dysentery Bacilli Were Present.**—Dr. John Howland reported the results of autopsies on 17 young children suffering from infection with the *Bacillus dysenteriæ*. In the majority of cases bacteriological examinations were made antemortem; in three cases where the condition had not been suspected during life the bacteriological study was post mortem. The organisms found corresponded in all cases to what is known as the Flexner Manila or indol producing dysentery organism. In eight cases cultures were made from all the organs at autopsy; but in no case was the bacillus found except in the intestinal tract. In one case, the liver contained *Streptococci*. The other organs remained sterile or showed only the colon bacillus, with the exception of the lungs which often showed a great variety of organisms. Fifteen of these 17 children developed the infection while in institutions; two were suffering from the disease at the time of admission. The cases could be divided clinically into four classes: Acute, subacute, cured (death being due to another condition developing later) and terminal infections. There were no chronic cases. The acute cases were those which were fatal in ten days or less from the beginning of the characteristic intestinal symptoms. These cases were more apt to show blood in the stools than were the subacute cases, and were accompanied by a more marked rise in temperature, though this was not the invariable rule. There were seven acute cases in this series, one showing a pseudo-membranous enteritis; one a marked necrosis and ulcerative process; and one in which there was merely intense congestion with beginning ulceration and necrosis. The detailed study of the post-mortem findings showed that as a result of the infection with the dysentery bacillus there was a great variety in the pathological conditions found. Acute cases and terminal infections showed usually very marked congestion, more or less deep necrosis and ulceration. The cellular infiltration of the mucosa was irregular; but in general the more acute the process the more pronounced the infiltration. The same was true of the edema and infiltration of the submucosa. The infiltration of the mucosa was largely polynuclear, while in the submucosa mononuclear cells predominated. In only two cases was the muscular layer affected, and then but slightly. The peritoneal coat was involved in only one case. In one of these acutely fatal cases the lesion was what would be usually considered as subacute; that is, slight congestion, no ulceration, except through the follicles which were excavated and showed moderate hyperplasia. Of the three cases classed as subacute by reason of the duration of the disease, two exhibited the same lesions as the acute cases, though to a less degree; while in the third the hyperplasia and depression of the follicles was the prominent condition and the mucous membrane was not necrosed. Microscopical examination of the tissues for organisms gave nothing characteristic. In the necrotic areas, bacilli negative to Gram of the proper form and size were found in enormous numbers, both in the acute and in the subacute cases; but cocci and bacilli positive to Gram were also very abundant. Usually the organisms were present in considerable variety, and did not penetrate deeply into the mucosa; but in one case they were present in the superficial portion of the submucosa. Both ileum and colon were usually affected, changes in the latter being most marked. In three cases, however, the ileum suffered the most, and in one of these, a pseudomembranous case, there was hardly any change in the colon. It is interesting to compare at this time these cases with the Manila ones in adults described by Flexner, the specific germ being the same. He found the histological lesions in the mucosa to consist chiefly of coagulative necrosis with exudation of fibrin and polymorphonuclear cells. In Dr. Howland's cases the necrosis and the polynuclear cells were present but no fibrin could be demonstrated, though special staining was done for this. Flexner found the submucosa always much altered, swelling, hemorrhages, fibrinous and cellular infiltration, and he said that the changes might take place beneath an intact or almost intact mucous membrane. In contrast to this, the cases described by Dr. Howland showed no hemorrhages or fibrinous infiltration and the swelling and accumulation of cells never took place except beneath a very much altered mucous membrane. The conclusions in regard to the organisms agreed; though in one of Dr. Howland's cases bacilli were found in the submucosa where Flexner has said he never found them.

From a consideration of these 17 cases it appeared that in those terminating acutely, marked congestion, ulceration, or superficial or deep necrosis is the rule, even though the disease had lasted as short a time as two days, while in the subacute cases the changes were more catarrhal in character, with an increased follicular hyperplasia: in other words, the pathological findings were determined more by the severity of the infection than by the length of time that the disease had lasted—a severe and overwhelming infection producing destructive changes rapidly, the clinical course being correspondingly acute and short; while a less severe infection was the cause of catarrhal processes with slight destruction, the clinical course being correspondingly long.

**Reaction to Different Sugars.**—Dr. Philip Hanson Hiss congratulated Dr. Wollstein and Dr. Howland on the interesting reports which they had made. There were several questions which he would like to ask Dr. Wollstein. She had spoken of the organisms falling into two groups: one group similar to the Shiga bacillus, and the other large group composed of organisms able to ferment many carbohydrates—mono-, di- and poly-saccharids—with the production of acid but not of gas. He would like to know how Dr. Wollstein had made her fermentation tests and what the source of her sugars had been. In the few cases which he had had the opportunity of examining he had found two groups of organisms, leaving the Shiga type out of the question, and he considered that unless the fermentation tests were very carefully made and the purest sugars were used that this difference might not be shown. Maltose at the best was very uncertain, and all the forms of organisms if left long enough in it would probably give rise to fermentation. These two groups were distinguished from the Shiga organism by the fermentation of mannite and from each other by the fermentation, in the case of the more active fermenters, of dextrin and saccharose. The less active group fermented mannite but could not utilize dextrin and saccharose. Dr. Hiss thought the careful study and separation of these organisms very necessary because this report included a large series of cases histologically studied, and if anything was to be made out about the connection of these organisms with the different types of disease this

was the only way to do it. Dr. Hiss considered it not unlikely that in other series of cases of dysentery and diarrhea studied in this country, the organisms had not in all instances been preserved, as it had been thought, from the methods of study then used in their identification, that they were of the true Shiga and Kruse type. Hence, the frequency of occurrence of the different groups and their relation to the different types of gastro-intestinal disease in which they occurred could not now be determined. He therefore wished to ask Dr. Wollstein how she had made her fermentation tests and whether she had attempted to establish the etiological relationship of the different groups of organisms to the various types of disease which Dr. Howland had determined.

Dr. Augustus A. Wadsworth asked Dr. Howland if he had used any stain beside the Gram for demonstrating the organisms in the lesions. Were any of the tannic acid stains used?

**Shiga Bacillus and Dysentery.**—Dr. James Ewing said that while it was perhaps a little late to raise a question regarding the existence of infection by the bacillus of Shiga in many cases of infantile diarrhea, yet it seemed to him that the relation between the disease and the bacillus had not been fully demonstrated in these valuable papers. It seemed to be a matter of importance to know in what relative abundance the Shiga bacillus had occurred in the stools of these infants, since it was probably not the only organism in the stools. It would have been of interest to know the results of a systematic study of the serum reactions of these patients, not only on the Shiga bacillus, but on the colon bacillus and other micro-organisms which might have been isolated. Perhaps the serum of some of the patients might have proved quite as active on other bacteria of the stools as on the variety of Shiga bacillus isolated and tested. It appeared that much work of this sort was needed to definitely fix the relation of intestinal bacteria to these intestinal diseases.

Dr. Wollstein said that the sugar reactions were made with the sugars obtained from Merck and had been made in two ways. The glucose, lactose, saccharose, mannite and maltose reactions were made in fermentation tubes as well as in litmus agar prepared without meat. The other sugars were used in the sugar-free litmus agar. In regard to Dr. Ewing's remarks, Dr. Wollstein said that she did not think that it had been absolutely proven that the dysentery bacillus had been the only etiological factor in these cases and that she had therefore taken pains to call her report simply "The Dysentery Bacilli in a Series of Cases of Infantile Diarrhea." The dysentery bacillus had certainly been present in the stools of 39 cases, in greatest numbers in the cases with much mucus and blood. In the stools which contained more fecal matter they were often very few and difficult to isolate.

Dr. Hiss said in regard to the sugars, especially dextrin, that he had had specimens from Merck marked "highest purity," which in fermentation tests were little better than glucose and had acted practically as did glucose in all differential tests. Much dependence could not, therefore, be placed upon sugars bought in the open market, and it was necessary to test them thoroughly before depending upon results obtained with them.

Dr. Howland said that he had stained the bacilli with Gram-Weigert and methylene blue. He had not assumed that all these bacilli were dysentery bacilli, and had therefore called them "bacilli of the typhoid-colon form negative to Gram." Nor had he assumed that in all these cases death had been due to dysentery.

**Cretinism in a Cat.**—Dr. F. H. Miller presented this case because of the extreme rarity with which it was observed in veterinary medical practice, this being the first case he had seen in fifteen years of practice. The head of the animal was suppressed in growth and was very wide across the forehead in proportion to the size of the cat. There was a condition of exophthalmos which was very marked. The under jaw was about one-third short of the length of the upper jaw and the tremendous thickening of the bone made it impossible to close the mouth. There was no anchylosis. The animal showed the short limbs and overdevelopment of the muscular tissue very unlike that of the rachitical patient. Dr. Miller said that he had seen the animal for the first time when it was about two months old. While, of course, the head had since grown a great deal, it had been even at birth very abnormally large, having the great width between the eyes. The cat had been examined by several doctors and oculists, and injections of atropine into the eye had shown a great difference between it and the normal eye. The periphery of the optic nerve was very pale and the nerve disc was very markedly depressed. It was important to state that the intelligence of the cat was very subnormal. Its life was entirely a matter of comfort and taking things easily. The pelvis was normal, and the great difficulty was in the limbs from the knee and elbow-joints downward. The metacarpal bones were more or less normal. It was impossible to find any trace of the thyroids, though careful examination had been made. There was probably either obliteration or total absence of them.

Dr. Stuart Hart asked whether the thyroids were palpable in the normal cat.

Dr. Miller said that they were readily found, especially in a cat of this size. He believed that in this case they were entirely wanting. The cat could take food only with great difficulty. There was a tremendous thickening of the facial bones. The teeth were set in a semicartilaginous bone, not true bone at all.

**A Case of Rhabdomyoma of the Tongue.**—Dr. Harlow Brooks and Dr. Stebbins reported a case of rhabdomyoma of the tongue, which was so far as they knew the only case ever reported, the tumor being very rare in striated muscle. The patient was a Hebrew, born in Russia but resident in this country for some time. The family history was negative. Two years before he had had a broken tooth which projected and irritated his tongue on that side until it raised a small nodule which he had had cauterized and cut off with a pair of scissors. The tooth had then been taken out. After this time the enlargement had given him no trouble, though he could still feel it, until six weeks before the last removal, when it had begun to enlarge. The nodule measured about .7 cm. across, .6 cm. in width, and .3 cm. in depth. It was solid and very firm. Microscopically, it did not show the typical form of rhabdomyoma such as was generally found in the organs of the genital tract. Nearly all rhabdomyomas have originated from the organs arising from the intermediary cell mass, so that this case had a double interest. Some of the tumor cells showed striation fairly well. There was no doubt but that the cells were those of striated muscle, though most of them were of a more embryonic type. They had gone beyond the stage of unstriated muscle fibers. The case was particularly interesting because the tumor arose from an altogether different embryonal source than the ordinary rhabdomyoma.

## BOOKS RECEIVED.

Medical Reports of the Sheppard and Enoch Pratt Hospitals. Volume I. Baltimore, Md.

The Refraction and Motility of the Eye. By Dr. W. N. Suter. 8vo, 390 pages. Illustrated. Lea Brothers & Co., New York and Philadelphia.

# THE MEDICAL NEWS.

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## ORIGINAL ARTICLES.

### FETAL, CONGENITAL AND INFANTILE TYPHOID.*

BY JOHN LOVETT MORSE, A.M., M.D.,

OF BOSTON, MASS.

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ALTHOUGH much has been written in the past regarding this subject and many cases reported from time to time, yet, on account of the inherent difficulty of the diagnosis from either a symptomological or pathological standpoint, but little reliance can be placed on the earlier data and no satisfactory conclusions drawn from them. Since the accurate differentiation of the typhoid bacillus and the discovery of the typhoid serum reaction, however, a certain amount of trustworthy material regarding fetal and infantile typhoid has accumulated. Conclusions based on these later data are of some real value.

*Abortion in Typhoid.*—Abortion occurs in from 50 per cent. to 70 per cent. of the cases of typhoid. Various causes have been advanced for this frequency of abortion. Among them are (1) the high temperature, (2) the accumulation of toxins in the maternal blood, (3) the death of the fetus. It is probable that there is no common cause and that the etiology varies in different cases, any one of the above causes being amply sufficient to produce abortion. Most writers agree, however, that the death of the fetus is the most common cause. This may result from the high temperature, the passage of toxins through the placenta, or intra-uterine typhoid, the last being probably the most common.

*Fetal and Congenital Typhoid.*—Under the head of fetal typhoid are included the cases which are born dead or die at birth, while under the head of congenital typhoid are included the cases which are born alive and suffering from typhoid. This division is an arbitrary one and comparatively unimportant. The important consideration is whether the infection is intra-uterine or extra-uterine in origin.

In considering the question of intra-uterine typhoid infection it is necessary, in the first place, to throw out all the cases described before the discovery of the typhoid bacillus and all the conclusions drawn from them. Analysis of these cases shows that the great majority of them were certainly not typhoid, and in none of them is the evidence convincing. Moreover, some of those which are supported by bacteriological examinations are open to criticism, as they were studied before the differences between the typhoid bacillus and the colon bacillus were as well recognized as they are at present. A considerable number of cases, however, have been sufficiently studied to be worthy of analysis and to form the basis for certain conclusions. Fifteen of these have been proved by autopsy and cultures, and one by autopsy and an increasing serum reaction. Ten were born dead and six died in from five minutes to three weeks after birth.

*Giglio: Miscarriage in sixth week of typhoid of 3½ months' fetus. Numerous hemorrhages in placenta. Microscopically typhoid bacilli in intervillous spaces. Fetus macroscopically and microscopically normal. Cultures from spleen, liver, intestines and blood of fetus showed typhoid bacilli.

*Eberth: Abortion of four months' fetus at end of third week. No changes in placenta. Typhoid bacilli were found in the intervillous spaces. Fetus was born dead in unbroken membranes. No changes in fetal organs. Cultures of typhoid bacilli were obtained from the heart's blood, lungs and spleen.

Lynch: Miscarriage at end of second week of typhoid at four months. Microscopically the placenta showed numerous hemorrhages. Sections of the placenta showed no bacilli. Cultures from the fetal blood and "organs" showed typhoid bacilli. The maternal blood gave a positive Widal reaction in a dilution of 1 to 50. The fetal blood was negative in a dilution of 1 to 10.

*Neuhauss: Miscarriage of a four-months' dead-born fetus on fourth day of convalescence after a relapse. No note as to placenta. Autopsy immediately after birth. The spleen was not enlarged and the intestines showed neither ulcers nor swollen Peyer's patches. Cultures of typhoid bacilli were obtained from the spleen, kidneys and lungs. The liver was sterile.

Etienne: Abortion at fifth month on twenty-ninth day of disease. No placental lesion. Cultures from placental blood showed typhoid bacilli. All the fetal organs were perfectly healthy. Spleen not enlarged. Intestines normal. Cultures from splenic and hepatic pulp and heart's blood showed many typhoid bacilli.

Fordyce: Delivery at fifth month in sixth week of typhoid during a relapse. No note as to condition of placenta. Sections of placenta and umbilical cord showed no bacilli. Fetus died during delivery. Very careful autopsy. Everything normal except for a small amount of serous fluid in the peritoneal cavity. This fluid gave an almost immediate positive Widal reaction. Sections of the liver, spleen and kidney showed no bacilli. Cultures from the kidney and spleen showed typhoid bacilli answering all tests, including the serum reaction. Cultures from the intestinal contents and heart's blood were sterile. The heart's blood, however, gave a positive serum reaction.

*Reher: Abortion of six-months' dead-born fetus on nineteenth day. The placenta was not examined. The spleen and mesenteric glands were not enlarged. The intestines were normal. No bacilli were seen in smears and sections of the liver and spleen. Cultures were obtained from these organs.

Balp: A woman with typhoid—proved by autopsy four days after delivery—miscarried in the fifth week of a six-months' fetus. The blood of the placenta and of the fetal spleen showed typhoid bacilli and the *Staphylococcus pyogenes aureus.*

* Read before the New York Academy of Medicine, March 19, 1903.

Hildebrandt: Miscarriage at end of second week of seven-months' dead-born fetus. No note as to condition of placenta. A few typhoid bacilli were found in the placental spaces. The spleen was possibly a little enlarged. The mesenteric glands were not enlarged. There were a few prominent solitary follicles in the lower ileum, but they contained no bacilli. Typhoid bacilli were found in the smears from the spleen, liver, mesenteric glands and blood; in sections of the spleen and kidneys, and in cultures from the spleen, liver, mesenteric glands and blood.

Frascani: Miscarriage in fourth week of eight-months' macerated fetus. Numerous placental hemorrhages. Maternal splenic blood (obtained with syringe) showed typhoid bacilli in cultures. Blood from the fetal organs gave pure cultures of typhoid bacilli.

Freund and Levy: Abortion at six months in fourth week of typhoid. Delivery conducted under strict aseptic precautions. Placenta showed evidences of an old endometritis, but none of any recent, acute process. Cultures from placenta showed typhoid bacilli. Cultures from surface of placenta sterile. Child died in fifteen minutes. Bacteriological examination begun five minutes later. There was a slight hyperplasia of the spleen, which appeared a little softer than normal. The intestinal mucosa was normal. There was no ulceration of Peyer's patches. Cultures from the splenic pulp and the heart's blood showed the bacillus of Eberth. Cultures from the vernix caseosa were sterile.

Dürck: A woman with typhoid was delivered of a living child on the twenty-fourth day. The child died in nine hours. There was marked swelling of the liver and numerous hemorrhages beneath its capsule. The spleen was enlarged and congested and typhoid bacilli and staphylococci were found in sections. The other organs were normal. Cultures from the liver and spleen showed typhoid bacilli and the *Staphylococcus pyogenes albus.*

Ernst: Miscarriage at eight months on eleventh day. No note as to placenta. Fetus lived ninety-three hours. It showed no symptoms of typhoid. It was not nursed by its own mother. It had icterus and died suddenly. The intestinal tract was normal. Typhoid bacilli were found in sections of the spleen, muscles, heart-muscle and blood-vessels of the brain and femur. Cultures were obtained from the spleen and heart's blood.

Legry: Abortion at seven months on fourth day of a relapse. No note as to placenta. The child was born alive and died after four days in an incubator. The liver of the fetus showed the same lesions as did that of the mother. A culture of the typhoid bacillus was obtained from the fetal liver.

Janiszewski: Miscarriage at 8½ months on twentieth day. No note as to placenta. Infant died on fifth day. The spleen was normal. There were superficial hemorrhages in the kidneys. There was bronchopneumonia. The other organs, including the intestines, were normal. The spleen, kidneys, mesenteric glands and lungs showed many typhoid bacilli microscopically. They were also obtained in cultures from these organs and from a piece of intestine near the ileocecal valve.

Brown: Miscarriage at eleventh day of seven and a half months' fetus. The mother had a typical typhoid with a positive Widal reaction. The infant's temperature was 100° F. at birth. It rose to 103° F., where it remained for about two weeks, after which it fell gradually to normal. The spleen was palpable and the stools yellowish and loose. There was no tympanites or roseola. The infant died of inanition two days after the temperature reached normal. The age of the infant at death is not stated. It was presumably about three weeks. On the ninth day the blood gave a partial Widal reaction in thirty minutes and a complete one in forty-five minutes; on the sixteenth day it gave a positive reaction in ten minutes. The spleen was large and soft. The ileum showed healed ulcers with the characteristic shaven-beard appearance. The mesenteric glands were enlarged. No microscopic examination and no cultures were made.

These cases prove, without question, that the typhoid bacillus can pass from the mother to the fetus through the placenta. This fact has also been demonstrated experimentally by Chantemesse and Widal, Frascani and Remlinger. While there is no doubt that bacteria can pass from the mother to the fetus through the placenta, there is some doubt as to whether they can pass through the normal placenta. This question is, however, unimportant for our purposes.

Ten of these cases were born dead or died at birth. One died in fifteen minutes, one in nine hours, two in four days, one in five days and one in about three weeks. None of them showed any special symptoms beyond fever, but simply did not thrive and died. In the absence of the symptoms of any other disease and with the bacteriological evidence of typhoid infection, it seems reasonable to attribute their death to this cause. It is possible, however, that prematurity may have played a part in their early death.

Several other cases have been reported as examples of intra-uterine infection, or congenital typhoid fever. In estimating the value of these cases, however, it must be remembered that not every infant with fever born of a typhoid mother is suffering from typhoid fever, and that a positive Widal reaction in the infant does not necessarily mean typhoid in the infant, but may be due to agglutinin transmitted through the placenta. Rouslacroix's cases show how careful we must be in making the diagnosis of typhoid in the infants of women with typhoid:

Rouslacroix: Miscarriage of twins at eight months, near the end of the second week of typhoid. The mother's blood gave a positive Widal reaction, in a dilution of 1 to 100, fifteen minutes before the birth of the children. The mother died later. Both infants had edema of the face and legs from the second day. They also developed marked icterus. They did not vomit and had normal stools. The temperature of both rose nearly to 104° F. on the fourth day. One died on the fifth day and the other on the sixth day. The autopsy showed nothing abnormal in one and a little bronchopneumonia in the other. Cultures from the blood and spleen of one showed colon bacilli and no typhoid bacilli. The blood of both infants at birth and four days after birth was negative in a dilution of 1 to 10 after two hours.

The cases reported as congenital typhoid fever are as follows:

Bell: Full term labor two days after temperature had reached normal in an attack of typhoid showing a positive Widal reaction. The infant was apparently healthy at birth but developed a temperature at once. The next day it reached 103.4° F. It remained high for seven days, when it suddenly dropped to 100° F. From this time on it gradually declined. There was marked jaundice and very many rose spots. The tongue was raw, shiny and red, and finally fissured. Stupor

was marked. The baby was nursed by its mother. Its blood gave a positive Widal reaction on the second day, while the leucocytes numbered 15,000. Three positive Widals were obtained during the week. The reaction of the milk was not tested. Four months later the mother's blood gave no Widal reaction, while the infant's gave a positive reaction in a dilution of 1 to 20 in two hours.

*Westervelt: Miscarriage at the beginning of the third week of 7½ months' fetus weighing 3 pounds 14 ounces. The mother's blood gave a positive Widal reaction. Ten hours after birth the temperature was 103.5° F. During the next seventeen days it ranged between 102° F. and 99.2° F. During the next three weeks it ranged from 99° F. to 97.8° F. and the child gained in weight. At this time the child had a convulsion and the temperature rose to 106.4° F. After this it was normal. The spleen was much enlarged, the abdomen was distended and the child had diarrhea. There were no rose spots. The Widal reaction was not tried. The infant recovered.

*Chambrelent and St. Philippe: Miscarriage at eight months. The infant did not do well from the start. It was feeble, had a large liver with jaundice and developed bronchopneumonia. Presumably it died. It was not nursed and was taken from the mother immediately. The infant's blood and the serum from a blister gave a very marked positive Widal reaction. The day on which the reaction was obtained is not given.

*Johnston: An infant was found to have fever five days after birth. From this time until the end of its illness the infant had a continued fever. Presumably it died, although no statement is made to that effect. As the case was reported in a discussion of infantile typhoid it is presumable that the mother had typhoid, but no such statement is made. Tympanites and constipation. No roseola. Marked restlessness. An older child in the house developed enteric fever a short time later. No further data.

*Krim: Miscarriage at the end of the second week, a week before term. Widal reaction in mother not tested. Infant's temperature at birth was 102° F. and five hours later 103.5° F. It ranged at about these figures for seventeen days, when it fell to normal. The infant was bottle-fed and made a good recovery. No other data as to symptoms or Widal reaction.

*Oakey: A woman with typhoid was delivered of a child at about full term. It was feverish at birth and died in ten days.

While Krim's, Johnston's and Oakey's cases may have been typhoid they cannot be accepted as proved because the data is insufficient. Westervelt's and Chambrelent and St. Phillippe's cases probably were typhoid, but here again the proof is hardly convincing. Bell's case was almost certainly typhoid. The most convincing point is the presence of the Widal reaction in the infant four months later while it was absent in the mother. It could hardly have been transmitted to the infant through the milk, because, when thus transmitted, it persists but a short time.

It is evident, therefore, that the fetus most often dies in utero as the result of the typhoid infection. If it is born alive it usually succumbs rapidly to an acute cachexia without special characteristics. If it lives longer it may develop some of the classic symptoms of extra-uterine typhoid and may possibly survive the disease.

*Cases in which the proof, bacteriological or otherwise, is not positive.

In 12 of these cases the organs were carefully examined macroscopically and often microscopically as well. In four the spleen was somewhat enlarged; in two of these it was slightly soft and in one congested. In one there were a few prominent follicles in the lower ileum but they did not contain bacilli, and in Brown's case which lived about three weeks there were healed ulcers and enlarged mesenteric glands. In one the kidneys showed superficial hemorrhages. In one other case in which only the liver was examined it showed microscopic changes identical with those found in the mother's liver, and in one there was marked swelling of the liver and numerous hemorrhages beneath its capsule. These were the only pathologic changes found in all the cases. It is evident, therefore, that the lesions of the intestine and mesenteric glands so characteristic of typhoid in extra-uterine life do not occur in intra-uterine typhoid unless the patient survives some time after birth. These organs are almost invariably normal. The liver and spleen are sometimes enlarged, however, and hemorrhages may take place into different organs.

These differences in the pathology of extra-uterine and intra-uterine typhoid are probably due in part to the difference in the method of infection, and in part to the fact that the intestine is not functionating in fetal life. In the one instance the bacilli enter through the mouth, localize themselves in the intestine, and thence comparatively slowly infect the organism through the blood; in the other they enter the circulation directly through the umbilical vein and cause a general infection from the start. One is a primary, the other a secondary septicemia. The experiments of Netter and Levy show that in intra-uterine pneumococcus infection pulmonary lesions do not develop when the lungs have not functionated. A pneumococcus septicemia results instead. If the lungs functionate after birth pneumonia may develop. The comparatively marked changes in the intestine in Brown's case, which lived three weeks, are of interest in this connection. Mamoinski, moreover, found that the spleen of a fetus whose blood contained an abundance of the spirochætæ of relapsing fever did not show any characteristic changes.

The lesions of intra-uterine typhoid infection are, therefore, general rather than local. The cases of adult typhoid without intestinal lesions and of severe and even fatal cases of typhoid with very slight intestinal symptoms are of interest in this connection. The results of the bacteriological examinations in the reported cases are important as giving corroborative evidence of the general septicemic nature of the infection in the fetus. Cultures were made in every case but one, but unfortunately not from all the organs in every case. Typhoid bacilli were found in the spleen in every instance in which cultures were made, and in the heart's blood and liver in all but one. They were found in the liver in nine cases, in the kidney in five, in the lungs in five, in the mesenteric glands in two and in the intestines

in two. Blumer's case, which developed in the three-days' old infant of a woman who had had typhoid when 4½ months pregnant, is interesting in this connection as showing the septicemic nature of the infection.

Blumer: Typhoid in fifth month of pregnancy. Full-term labor. Infant normal at birth. Three days after birth infant developed convulsions, which continued. On the fifth day bleeding began from an erosion of the cervix and continued. Death on ninth day. The autopsy showed hemorrhages into the kidney, bladder, vagina, uterus, esophagus, intestines and mesenteric glands. There was swelling of the spleen and cloudy swelling of the liver and kidneys. There was a follicular colitis and ileitis. The histological findings in the organs were those described by Mallory in the typhoid of adults, but less in degree Cultures from the heart's blood, liver and kidney were negative. Those from the lung, umbilical cord, bile, spleen and contents of colon contained typhoid bacilli. Blumer thinks that the typhoid bacilli must have remained latent in the fetal tissues for four and one-half months and then suddenly became disseminated, causing the septicemic type of the disease. He thinks that the disease developed too soon for infection from outside. The infant was breast-fed and the mother's urine contained no typhoid bacilli.

The septicemic nature of the infection accounts for the extreme mortality in fetal and congenital typhoid. This mortality may, however, be more apparent than real as it is possible that a certain number of the infants which are born alive and well after typhoid fever in the mother may have had the disease in utero. A positive Widal reaction has been found in the blood of several infants born under such conditions. Unfortunately, however, this cannot be accepted as proof of intra-uterine typhoid, as the agglutinating power may have been transmitted from the mother through the placenta, the fetus not having had the disease. The case of Etienne's, in which the serum reaction was stronger in the fetal than in the maternal blood, does seem to suggest, nevertheless, that the fetus may survive an intra-uterine infection.

Etienne: A woman, five months pregnant, died on the fifteenth day. She did not miscarry. The fetus died as the result of her death. All the fetal organs were normal and cultures from its heart's blood, liver and spleen were sterile. The fetal heart-blood gave a positive Widal reaction in a dilution of 1 to 200, while that of the mother reacted only in a dilution of 1 to 150. He concludes, and it seems justly, that as the agglutinating power of the fetal blood was greater than that of its mother it did not pass from the mother to the fetus through the placenta, but was produced by the fetus itself. This may have been as the result of a previous intra-uterine infection or in response to toxic absorption through the placenta. The absence of typhoid bacilli in the organs is consistent with either explanation. The latter seems the more probable, however.

This case seems to be the only one which in any way goes to show that recovery from fetal typhoid ever occurs. There are many cases on record, however, which prove that infection of the fetus is not a necessary result of typhoid in the mother. Among these are those of Frascani, Charrier and Apert, Osler, Etienne, Fraenkel and Simmonds, Darling, Wilson, Ker, Griffith, Morse, Plauchu and Gallavardin, Jehle, Mahrt and Rouslacroix.

The following conclusions regarding fetal and congenital typhoid seem justified:

1. The typhoid bacillus can transverse the abnormal, and possibly the normal, placenta from mother to fetus. Other organisms may also pass in the same way.

2. Infection of the fetus results. Because of the direct entrance of the bacilli into the circulation, intra-uterine typhoid is from the first a general septicemia. For this reason, and probably also because the intestines are not functionating, the classical lesions of extra-uterine typhoid are wanting.

3. The fetus usually dies in utero or at birth as the result of typhoid infection.

4. It may be born alive, but feeble and suffering from the infection. If so, death usually occurs in a few days without definite symptoms.

5. If it lives longer it may develop some of the classical symptoms of extra-uterine typhoid infection and at death may show some of its pathological lesions. Death is the usual result, but certain imperfectly reported cases suggest, if they do not prove, that recovery may take place.

6. It is possible that the fetus may pass through the infection in utero and be born alive and well. There is, however, no proof that this happens.

7. Infection does not always occur. The pregnant woman does not necessarily transmit the disease to her child.

*Infantile Typhoid.*—A number of years ago there was much discussion as to whether or not typhoid fever ever occurred in infancy. This discussion was soon settled in the affirmative. Since then, however, there has been much difference of opinion as to the frequency of typhoid in infancy, that is, in the first two years of life.

There is no very evident reason why the infant should be less susceptible to typhoid infection than the adult; in fact, judging from his greater susceptibility to bacterial infection in general, he should be more so. The exposure during the first year, when the infant is usually fed on breast milk or some cooked food, is undoubtedly less than in adult life. In the second year, however, when it is fed largely on raw milk it should be greater, exposure through water being the same in both cases. Nevertheless, statistics in epidemics and in large series of cases apparently show that typhoid is very uncommon at this age. On the other hand, several large series of cases, some of which reach into the hundreds, have been collected from literature. These series prove, what no one at present denies, that typhoid fever occurs in infancy. They also prove that the literature of the last fifty years contains the reports of a considerable number of cases of typhoid in infancy. Granting that all the cases reported as typhoid really were typhoid, these few hundred cases are insignificant in comparison to the thousands of cases which have been reported in adults

during the same time. Thus, instead of proving that typhoid occurs frequently in infancy, they merely serve to emphasize its apparent infrequency. It cannot be granted, however, that all the cases in these series really were typhoid. In many the diagnosis is most certainly incorrect, and in more doubtful. When these incorrect and doubtful cases are eliminated, as they should be, the apparent infrequency of typhoid in infancy becomes even more evident. A striking thing about the cases which certainly were typhoid is the large proportion of them which occurred in connection with other cases in the same house or during severe epidemics. This suggests that infants contract the disease only when the exposure is considerable.

There can be but two interpretations of these figures: either typhoid fever is relatively uncommon in the first two years of life, or it is not recognized when it occurs. If it is not recognized when it occurs it must be because the disease at this age does not resemble the type seen in older children and adults, and hence is mistaken for some other condition.

Three methods are available for determining the type of typhoid in infancy: (*a*) Analysis of the previously reported cases in which the diagnosis is proved by a positive Widal reaction or by the cultivation of typhoid bacilli from the organs; (*b*) the use of the Widal test in large numbers of cases not clinically typhoid; (*c*) routine bacteriological examinations in large series of autopsies.

I find reports of 32 cases of typhoid fever in infants under two years of age, in which the diagnosis is proved by a positive Widal reaction (23), bacteriological examinations (5), or both (4).

Cassoute: Two months old. No fever. "Of all the usual signs of typhoid the only one present was persistent diarrhea." Death. Positive serum reaction in half an hour. Autopsy showed 14 infiltrated Peyer's patches, several of which had begun to ulcerate.

Griffith: Three months old. Diarrhea. No note as to roseola. Spleen enlarged. Duration fourteen days. Death. Positive Widal reaction from heart's blood. Autopsy showed throughout the ileum, and especially in its lower portion, Peyer's patches thickened, reddened and somewhat depressed. Microscopical examination showed infiltration and ulceration. The spleen was unusually large, soft and dark and the mesenteric glands enlarged.

Legry: Four months old. Bloody stools. Death. Autopsy showed enlargement of the follicles of the small intestine. Some isolated follicles and some of the Peyer's patches showed in their centers a depression corresponding to an ulceration to which was sometimes adherent a clot. Spleen enlarged. Typhoid bacilli cultivated from intestine and feces.

Roemheld: Seven months old. House epidemic. Abdomen slightly distended. Slight diarrhea. No roseola. No demonstrable enlargement of spleen. Duration, eighteen days. Death. Autopsy showed intestines normal except for slight injection of lowest Peyer's patches; spleen enlarged; mesenteric glands slightly enlarged; typhoid bacilli found in spleen.

Abt: Eight months old. Sudden onset with fever and vomiting. Fever high. Distention. Roseola. Spleen enlarged. Death with multiple gangrene. Positive Widal reaction. Bacilli "probably typhoid" cultivated from spleen.

Love: Eight months old. Dry tongue. No distention. No diarrhea. Roseola. No note as to spleen. Duration, twenty-one days. Recovery. Widal reaction positive.

Netter: Eight months old. Duration, nine days. Death. Widal reaction not mentioned. Autopsy showed lesions as well marked as in the adult. Cultures of typhoid bacilli obtained from spleen and mesenteric glands.

Netter: Eight months old. Duration, sixteen days. Death. Widal reaction not mentioned. Autopsy showed lesions as well marked as in the adult. Cultures of typhoid bacilli obtained from spleen and mesenteric glands.

Churchill: Eight months old. No note as to distention. Constipation. No roseola. Spleen not enlarged. Recovery. Positive Widal reaction.

Northrup: Nine months old. Stupor. Distention. Diarrhea. Roseola. Spleen enlarged. Duration, twenty-four days. Recovery. Widal reaction positive.

Méry: Nine months old. Breast and other food. No note as to whether nurse had previously had typhoid. No note as to distention, diarrhea or spleen. Roseola. Duration over two weeks. Recovery. Widal reaction positive.

Nobécourt and Berthrand: Eleven months old. Throat slightly red. Tongue coated in center, red at edges. Stupid. Strabismus. Rigidity of neck. Coarse râles both lungs. Meningeal symptoms marked at first and later diminished. Distention. Diarrhea. Roseola. Spleen not noted. Duration, over eleven days. Death. Positive Widal reaction.

Nobécourt: Eleven months old. No note as to distention or size of spleen. Rose spots and diarrhea. Duration and result not stated. Widal positive in dilution of 1 to 30.

Mitchell: Thirteen months old. Onset with fever. Bronchial and intestinal catarrh. Tongue coated. Distention. No note as to diarrhea or roseola. Spleen enlarged to percussion, but not palpable. Duration, eighteen days. Recovery. Positive Widal reaction.

Morse: Thirteen months old. Fed on milk. Mother had typhoid. Condition not typhoidal. No distention. Slight diarrhea. Roseola. Spleen easily palpable, two fingers' breadth below costal border. Duration, three weeks. Recovery. Positive serum reaction on three occasions.

Blackader: Thirteen months old. Slow onset. Seven days after onset picture that of incipient meningitis. Slight distention. Diarrhea. No roseola. Spleen palpable. Duration, twelve days. Death. Autopsy showed typhoid lesions and typhoid bacilli in the intestines.

Lazarus-Barlow: Thirteen months old. House epidemic. Bronchitis. Distention. Diarrhea. Roseola. Spleen not palpable. Duration, twenty-five days. Death. Positive Widal reaction. Autopsy showed normal intestines and a firm and somewhat enlarged spleen. Typhoid bacilli were isolated from the spleen.

Nobécourt and Berthrand: Fifteen months old. Tongue coated. Distention. Diarrhea. Roseola. No note as to spleen. Duration more than twenty days. Recovery. Positive Widal reaction.

Griffith: Fifteen months old. House epidemic. Distention not noted. Diarrhea. Roseola. Spleen not enlarged. Duration, three weeks. Recovery. Positive Widal reaction.

Samuels: Eighteen months old. Carphologia. Subsultus. 35,000 leucocytes. Distention not noted. Constipation. No roseola. Spleen enlarged. Duration, twenty days. Recovery. Positive Widal reaction.

Long Island College Hospital: Eighteen months old. Mother and sister had typhoid. Condition slightly typhoidal. No note as to distention or diarrhea. Roseola. Spleen enlarged. Duration, twenty days. Recovery. Positive Widal reaction.

Haushalter: Eighteen months old. Sudden onset with vomiting, diarrhea and stupor. Rigidity of neck; nystagmus; contractures; carphologia. Distention. No diarrhea. Roseola. Spleen not noted. Duration, fourteen days. Death. Positive Widal reaction. Autopsy showed the characteristic lesions of typhoid about the cecum but less intense than in the adult. Typhoid bacilli cultivated from the spleen.

Nobécourt: Eighteen months old. Distention, rose spots, diarrhea and splenic enlargement. Duration, thirty-eight days. Death. Widal reaction positive in dilution of 1 to 30. No autopsy.

Strasser: Nineteen months old. Acute onset with pulmonary symptoms and solidification of lung. No note as to distention. Bowels normal. Roseola. No note as to spleen. Duration, more than eighteen days. Recovery. Positive Widal reaction.

Griffith: Nineteen months old. Diarrhea. Roseola. Spleen much enlarged. Duration, four weeks. Recovery. Positive serum reaction.

Griffith: Nineteen months. Diarrhea. Roseola. Spleen much enlarged. Duration, not determined because of complicating diphtheria. Recovery. Positive Widal reaction.

Churchill: Twenty months old. No note as to distention. Diarrhea. No roseola. No enlargement of spleen. Duration not given. Death. Positive Widal reaction.

Bryant: Twenty-one months old. House epidemic. Distention. Diarrhea. Vomiting. No note as to roseola. Spleen enlarged. Duration, twenty-two days. Death. Positive Widal reaction in 1 to 20 dilution in two minutes. Autopsy showed intestines normal; spleen slightly enlarged; mesenteric glands large and soft. Cultures of typhoid bacilli which answered all tests were obtained from the mesenteric glands.

Churchill: Twenty-one months old. No note as to distention. Diarrhea. No note as to roseola or spleen. Recovery. Positive Widal reaction. Duration not given.

Nachod: Twenty-two months old. House epidemic. Diarrhea. Spleen enlarged. No note as to distention or roseola. Signs of bronchopneumonia. Duration not determined. Death from bronchopneumonia. Pronounced positive Widal reaction. Autopsy showed intestines normal. Peyer's patches not swollen and showed no loss of substance. The spleen was much enlarged. Mesenteric glands somewhat enlarged and rather hard. Cultures from the intestinal contents showed no typhoid bacilli. Pneumonia in right lung. He considers that the patient was recovered from the typhoid and died as the result of the sequelæ. On this ground explains the absence of the bacilli in the intestine and the presence of the Widal reaction.

Abt: Twenty-three months old. Distention, condition of bowels and roseola not noted. Spleen enlarged. Duration, sixteen days. Recovery. Positive Widal reaction.

Sixteen of these cases died and 15 recovered, giving a mortality of over 50 per cent. This figure is undoubtedly higher than the average mortality of infantile typhoid, because of the basis on which the cases were chosen. It does show, however, that typhoid is not a very mild disease in infancy. The spleen was enlarged clinically in 15, or 68 per cent. of the 22 cases in which it was mentioned. Rose spots were present in 16, or 69 per cent. of the 23 cases in which they were sought. Distention of the abdomen was noted in 11, or 73 per cent., of 15 cases. The stools were normal in one of the 27 cases in which their character is mentioned. There was diarrhea in 19, or 78 per cent., and constipation in 5, or 19 per cent. The average duration in 10 cases which recovered was twenty-one days, and in 10 which died, eighteen days. The fever was, as a rule, high. The onset was sudden in three cases; in one with vomiting, and in the others with pulmonary symptoms. Nervous symptoms were marked in four, in two of which meningitis was suspected.

Analysis of these cases seems to show that with some minor exceptions the symptoms of typhoid fever in infancy are essentially the same as in adults, but that the course is shorter and the mortality much larger. The conclusion seems justified that the type of typhoid in infancy, at least as regards its symptomatology and diagnosis, is the same as in adult life. It seems probable, therefore, that the reported cases afford a fairly reliable basis on which to determine the frequency of typhoid fever in infancy.

These conclusions must be accepted as essentially correct, if the cases on which they are based are representative. It is possible, however, that they comprise only the severe and fatal cases, and that many other milder cases have been passed unrecognized. If so, they are misleading. The two other methods for determining the type of typhoid in infancy, namely, the use of the Widal test in large series of cases not clinically typhoid, and routine bacteriological examinations in large numbers of autopsies, should settle this point. I know of but two comparatively small series of cases in which the former method, and of none in which the latter has been used.

Dr. Thayer and I, in 1898, tried the Widal test in 50 cases of gastro-enteric diseases in infancy. A positive reaction was obtained in but one case, and in this instance the agglutinative reaction may possibly have been transmitted from the mother. Our results were, therefore, essentially negative. Dr. Churchill, of Chicago, had the blood of 65 infants suffering from diarrheal diseases tested for the Widal reaction last summer. A positive reaction was obtained in four. Two of these died. Unfortunately, the cases were not carefully followed, and the rather meagre data teach us little or nothing as to the type of the disease in infancy.

Although the results thus far obtained from this method of investigation have been unimportant and inconclusive, it certainly seems to offer the most favorable means for determining the type of infantile typhoid, and indirectly the frequency of its occurrence. It must, however, be carried out in large series of cases, preferably in times of epidemic or in cities in which typhoid is prevalent. We cannot hope to get much help from such healthy cities as Boston and New York, but must look to such unsanitary places

as Philadelphia and Chicago for the solution of the problem.

*Conclusions.*—Typhoid fever occurs in infancy. Except for the lessened exposure in the first year through food, there is no apparent reason why typhoid should be less common in infancy than in later life; in fact, because of the greater susceptibility of infants to bacterial infection, it should be more common. Nevertheless, judging from the number of cases reported it does occur less frequently. This infrequency may be real or apparent. If apparent, it must be because the disease is unrecognized or mistaken for other conditions. Analysis of the reported cases, in which the diagnosis rests on a positive Widal reaction or positive cultures of the typhoid bacillus, shows that the type of typhoid fever in infancy, at any rate as regards its symptomatology, is essentially the same as in adult life. It is possible that this conclusion may be erroneous, as it may be based on the severe cases alone, the milder having escaped notice. The Widal test in large series of cases not clinically typhoid, and bacteriological examinations in large series of autopsies, offer the best means of solving this problem. The results thus far obtained by these methods are unimportant and inconclusive. They should be continued in large numbers of cases, especially in epidemics and in cities where typhoid is prevalent. In the light of our present knowledge, the symptomatology of typhoid fever in infancy is essentially the same as in adult life, and it is really and not apparently infrequent at this age.

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## SOME CASES OF PROSTATECTOMY, OBSERVED AFTER AN INTERVAL.*

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The condition of our patients upon whom we have operated, observed after a considerable interval, is always interesting.

The utility of certain operations is sometimes questioned, especially by our purely medical brethren, on the ground that we record our cases as cured because they are alive and able to walk out of the hospital. Without questioning the justice of this criticism in certain cases, it is always gratifying and instructive to learn that the improvement in health following a serious surgical procedure is satisfactory and permanent.

These remarks apply to cases of prostatectomy with especial force. In this condition the sufferings of the individual have been so great that permanent relief must be an inestimable boon. Upon pathological grounds, moreover, an interesting question arises, viz., we know that in advanced cases of prostatism at least, the condition depends not only upon the obstruction to urination produced mechanically by the enlarged gland, but also upon degenerative changes in the muscular structure of the bladder, and it might be assumed upon reasonable grounds that such changes would cause a permanent and perhaps progressive loss of expulsive power on the part of the bladder, resulting in insufficiency of even a progressive character and attended by a continuance of bacterial growth and cystitis.

Many of the cases also from whom the prostate has been removed suffer for a very considerable time from more or less complete loss of the sphincteric action of the muscles normally operating to prevent the leakage of the bladder contents—in other words they dribble. Whether this condition is ever a permanent one is a subordinate question of some interest.

The cases of prostatectomy in which I have been able to trace the later history of the individual are few, but I feel that, owing to the comparatively short time since this operation came to be generally performed, their presentation

* Read before the Section on Genito-urinary Surgery, Academy of Medicine.

needs no apology. I trust that this paper may call forth from the members of the society a relation of their own experiences in regard to the ultimate results of prostatectomy.

The cases of prostatectomy which I have done were operated upon by a perineal incision. A second abdominal incision having been used to afford access to the prevesical space, the fingers of the left hand inserted into this abdominal wound afforded counter-pressure for the fingers of the right hand working in the perineum. This method was first used by me on October 3, 1899.

It had been suggested by Dr. Parker Syms that an opening should be made into the peritoneal cavity above the pubes for the purpose of introducing the fingers of the left hand and pressing the prostate downward toward the perineum. It occurred to me that an incision into the prevesical space would be equally efficacious and perhaps less dangerous. It was, of course, the intention of Dr. Syms to sew up the peritoneal wound after the enucleation was completed, and it seemed to me that a defilement of the fingers of the left hand would be pretty sure to occur during the operation, with possible danger of infecting the peritoneum, and that perhaps an infection of the prevesical space might be less dangerous. Be that as it may, my first prostatectomy was operated upon in this manner. I sought to avoid infection of the suprapubic wound by making this part of the operation with gloves. The glove was then removed from the right hand and the perineal operation was performed. After draining and packing the perineal wound a fresh pair of gloves was put on and the suprapubic wound was sutured. Primary union of this portion of the wound occurred. At the time I attached no particular consequence to this trifling modification of the operative technic, and I have always been ready to agree that in a considerable number of cases the suprapubic incision opening into the bladder offers advantages in certain directions. I believe, however, that the suprapubic incision of the bladder itself is not always necessary or even desirable, and that primary union of the suprapubic wound, if such be made at all, can best be obtained by an incision into the prevesical space which does not open into the bladder.

I am aware that in slender, thin individuals perineal prostatectomy can be performed quite well without any suprapubic incision at all or by the use of some device for drawing down the prostate into the perineum, such as the water-bag of Dr. Syms, or by means of a hook introduced into the prostate through the rectum, as suggested by Dr. Gibson.

At the time I showed my first case of prostatectomy, on January 24, 1900, at a meeting of the New York Surgical Society, I was unaware that the incision into the prevesical space without opening the bladder had been used by anyone else. I subsequently learned that Dr. J. P. Bryson, of St. Louis, performed an operation in the same manner, at least as early as December 5, 1898.

According to the St. Louis *Medical Review* this modification was first suggested by Dr. Bryson in the issue of that journal of April 1, 1899.

A similar technic has been developed by Dr. Guiteras, published in the Philadelphia *Medical Journal*, April 20, 1901. Any small credit, then, which may belong to the originator of this modification of technic undoubtedly belongs to Bryson.

The perineal incision which I have used is the curved incision convex forward, extending across the perineum about on the level with the bulbous portion of the urethra.

After separating the muscles surrounding the urethra from the anterior extremity of the sphincter ani, the prostate is exposed by blunt dissection. A sound in the urethra affords a convenient guide during this part of the operation. When the prostate is reached it is pushed downward by the fingers of the left hand, inserted into the suprapubic wound, and it is usually possible in uncomplicated cases and with suitable retraction to expose the lower or perineal surface of the prostate to the eye. An incision is then made obliquely upward and outward through the capsule of each lateral lobe of the gland. The enucleation is then accomplished by separating the capsule of the gland with the forefinger of the right hand.

The most adherent surface is that in contact with the floor of the urethra, and a tear at this point usually occurs in separating one or the other lateral lobe. Through this opening the drainage tube is subsequently introduced into the bladder.

During the enucleation the downward pressure of the forefinger of the left hand is of the utmost practical utility for two reasons. The first reason is self-evident, viz., a point of counter-pressure is thus constantly maintained against which the enucleating finger is working. The second reason has not, I believe, attracted the attention it merits. It is that by the downward pressure the prostatic plexus of veins is put upon the stretch and their lumina obliterated. While the pressure is exerted the hemorrhage during the enucleation is at a minimum. When the pressure ceases profuse venous oozing occurs. Every ounce of blood lost by an old man diminishes his chances of a rapid return of strength and prolongs his confinement to bed, so undesirable in these elderly patients.

After the enucleation is completed the finger of the right hand may be introduced into the rent in the prostatic urethra and the bladder explored bimanually for stone or other complications.

While in the majority of instances a suprapubic opening into the bladder may not add materially to the immediate risks of the operation it does not appear to me in the average case to possess material advantages. If it be asserted that a suprapubic opening provides better drainage, it may be said in reply that perineal drain-

age is, in the experience of many, entirely satisfactory.

Moreover, it is hard for me to believe that the almost inevitable soiling of the suprapubic wound with infectious urine is to be regarded as an entirely innocuous condition. Indeed, in a case recently operated upon by me for the removal of the prostate, a former suprapubic operation for stone, done by another surgeon, was followed by urinary infiltration of the abdominal wall putting the patient's life in jeopardy and involving a slow and tedious convalescence.

There can be no question but that perineal drainage is less difficult to take care of, and if suprapubic drainage is imperfect, the abdominal wall is macerated in ammoniacal urine, rendering the patient a disgusting object to himself and others.

Although my cases have been too small in number to base upon the results any general conclusions yet, as far as they go, they would indicate that in individuals operated upon before the muscular tone of the bladder and replacement of the muscular bundles by connected tissue have advanced to a marked degree, there is no special tendency for the loss of power to expel the urine to become progressive; or, if such tendency exists, it is but slight. A résumé of the four cases observed after an interval substantiates this view:

*Case I.*—Aged sixty-one years; prostatectomy Oct. 2, 1899. Symptoms of prostatism had existed for five years; residual urine, 5 ounces. Jan. 24, 1900, residual urine, 1 dram—no cystitis; Jan. 2, 1903, residual urine, 1 ounce—no cystitis.

*Case II.*—Aged fifty-eight years; prostatectomy Feb. 15, 1901. Symptoms of prostatism had existed for four years; marked cystitis; absolute retention for four months. Examination three months after his discharge from the hospital, no cystitis; no residual urine. Examination Jan. 10, 1903, normal frequency of urination. A few shreds in the urine; residual urine not sufficient to flow through the catheter—estimated at one dram.

*Case III.*—Aged fifty-seven years; first attack of retention a few weeks before admission. Since then complete retention with dribbling. Bladder enormously distended. Prostatectomy July 18, 1901. Forty-five days later, urine normal; amount of residual urine too small to be measured. Examined Jan. 2, 1903, normal frequency of urination. Urine contains a faint mucous cloud; residual urine, 1½ ounces.

*Case IV.*—Aged sixty-four years; history of prostatism extending over nine years; severe cystitis; residual urine, 1 pint. Prostatectomy August 17, 1902. Fifty-six days later amount of residual urine very small. Cystitis cured. Five months later urination was said to be of about normal frequency. Urine for most part entirely clear. His residence is in another State, and his amount of residual urine I have been unable to obtain.

In order to illustrate the method *of removing the prostate which I have pursued* in these and other cases, I will read the history of Case III:

Prostatectomy. H. E. K., aged fifty-seven years. Merchant, native of Germany. Was admitted to the hospital July 14, 1901, complaining of retention of urine, with dribbling. The patient is a large, stout man, obese and rather flabby. He has a marked alcoholic habit. Has in general enjoyed good health and has never had any derangement of the genito-urinary tract, except gonorrhea, forty years ago. He has had retention of urine with dribbling for the past ten days, and has been catheterized twice during this time. The urinary bladder forms a large tumor reaching to the umbilicus. Sixty-four ounces of urine were withdrawn through a catheter and replaced by a pint of warm boric acid solution. While the bladder was empty, rectal examination showed a marked enlargement of the prostate. The urethra was found to be free from stricture. During the next few days the patient's inability to urinate continued. He suffered from an enormous polyuria. His urine was of low specific gravity, contained albumin and a few blood cells. Prostatectomy was proposed and done four days after his admission to the hospital. Gas and ether anesthesia. A two-inch vertical median suprapubic incision was made in the median line of the abdomen into the prevesical space. The patient was then placed in the lithotomy position. A sound was then introduced into the urethra. A curvilinear perineal incision convex forward was made extending from ischial tuberosity to ischial tuberosity. Anteriorly in the median line this incision crossed the perineum at a point a little in front of the tendenous raphé between the muscles surrounding the bulbous portion of the urethra and the sphincter ani. The skin and fascia were divided in the line of incision and the muscles of the bulbous portion of the urethra exposed. The tendenous raphé between the muscles surrounding the urethra and the sphincter ani was cut with a scissors and the rectum was separated from the urethra by blunt dissection with the forefinger of the right hand until the prostate was exposed. Two fingers of the left hand were then introduced into the suprapubic wound and used to press the prostate downward into view. In order to accomplish this the urethra was drawn forward and the perineal flap backward by means of retractors. The capsule of the prostate was then incised upon either side of the median line obliquely upward and outward.

Enucleation of the prostate was accomplished by the forefinger of the right hand working within the capsule, the fingers of the left hand being used for counter-pressure. Before the enucleation was completed the mucous membrane of the prostatic urethra was torn to a moderate extent, the bleeding was controlled largely by continuous pressure downward with the fingers of the left hand. Drainage of the bladder by means of a large thick-walled catheter

passed into the perineal wound and through the rent in the prostatic urethra into the bladder. Sterile gauze packing introduced upon either side of the catheter into the cavities, left after the removal of the lateral lobes of the prostate. Partial suture of the perineal wound at either angle. Suture of the suprapubic wound with clean gloves. The post-operative treatment consisted in systematic irrigations of the bladder with boric acid solutions, and the administration of urotropine by mouth. Perineal tube removed on the tenth day. Thirty-four French sound passed through the urethra into the bladder once every five days thereafter. Patient up on the twentieth day. No notable disturbance of temperature or pulse occurred.

Patient continued to leak through the perineum for six weeks, after which all the water was passed through the urethra. There was no cystitis. Amount of residual urine at the time he left the hospital was not noted. It is said to be small. This patient was examined Jan. 2, 1903. His general health, he states, is perfect. This coincides with his appearance. He says there are no symptoms to attract his attention to his urinary apparatus. He urinates at intervals from four to five hours during the day without effort and without pain. Only occasionally when he drinks beer is he obliged to rise at night. His urine shows only a faint cloud of mucus. The residual urine measures 1½ ounces.

*Case I.*—R. M., aged sixty-one years; entered the hospital Oct. 2, 1899. He gave a history of difficult urination with occasional attacks of retention extending over a period of five years. The patient was a small man, fairly well nourished. Examination showed a moderate symmetrical enlargement of the prostate. His urine showed the presence of well-marked cystitis. Residual urine five ounces. The patient was obliged to pass water every few minutes by day and at frequent intervals during the night. He suffered continual pain and was anxious to submit to a radical operation. Casts were not detected in the urine. Operation on the second day after admission. Suprapubic incision into the prevesical space. Curved incision in the perineum as described. Enucleation of the prostate. Suture of suprapubic wound. Perineal drainage. Primary union of suprapubic wound. Perineal drain removed on the tenth day. Stay in bed eighteen days. Leakage through the perineum for several weeks longer.

This patient was examined Jan. 24, 1900. At that time he had one dram of residual urine. He urinated with about normal frequency. His urine was clear. He suffered little or no pain. Examined again Jan. 2, 1903, three years and three months after operation. General health good. Urination every three hours during the day. Urinates once during the night. Urine absolutely clear. Occasionally at the end of urination he has a little twinge of pain as the prostatic urethra is closed. Has not had sexual intercourse since the operation, although he has desire and occasional erections. He believes that these are not complete. Residual urine, one ounce. He takes urotropine from time to time.

*Case II.*—S. B., aged fifty-eight years. Admitted to the hospital Feb. 11, 1901. No venereal disease. Patient is rather poorly nourished. Always well, except for bladder trouble, which commenced four years ago. Since then gradually increasing difficulty in urination. Four months ago retention. Occasional catheterization since that time. For the past fortnight retention has been complete. Moderate enlargement of the prostate to be made out per rectum. The left lateral lobe feels twice the size of the right. Urine withdrawn through catheter shows moderate cystitis with acid urine and a few granular casts. The patient was put upon urotropin and his bladder was irrigated with boric acid every eight hours for four days. Twenty-four hours' quantity of urine, 50 ounces. Prostatectomy Feb. 15, 1901. Two-inch vertical cut in the median line above the pubes opening the prevesical space; curved perineal incision as described. Exposure of the prostate. Prostate easily pushed into view with fingers of left hand introduced into the suprapubic wound. Incision of the capsule of the prostate on either side of the urethra and enucleation with the forefinger of the right hand. Perineal drainage with large rubber tube and packing. Suprapubic wound closed. Moderate hemorrhage during and moderate shock after the operation. Bladder irrigated daily through perineal tube. Perineal tube removed on the tenth day. Patient sat up on twelfth day. Thirty French sound passed every four days afterward, for sixteen days. Patient left hospital on thirty-ninth day. In this case the bladder ceased to leak through the perineum at an early date, and at the time the patient left the hospital the functions of the bladder had become nearly normal. The prostate seemed to contain rather more glandular tissue than usual. Its removal was very easy.

The patient was seen after an interval of three months. At this time he urinated with normal frequency and good force. There was no residual urine. His urine was entirely clear and free from pus. He had gained 25 pounds in weight. Examination Jan. 10, 1903. General condition excellent. Urination painless. Urinates three times during the day. Rises once to urinate at night. Urine, clear, contains a few shreds. Residual, one dram not enough to flow through catheter. Does not have erections.

Case III was described in a preceding column of this article.

*Case IV.*—G. H., aged sixty-four years. History of difficult urination extending over nine years. For the past two years his condition has grown much worse. Pain has increased, cystitis at times has been severe. For some time past he has had involuntary dribbling at night. The patient is spare in physique. He has moderate arterial sclerosis. The prostate feels uniformly enlarged. Residual urine, one pint. The urine

is alkaline. Specific gravity 1.010, contains albumin, blood and pus but no casts. He was operated upon Aug. 17, 1902. Prostatectomy was done easily by the operation already described. There was very little bleeding and no notable shock. The perineal tube removed on the seventh day but reinserted on the twelfth day on account of rise in temperature. Removed permanently on the twentieth day. Patient up on the twenty-first day. Daily irrigations of the bladder with boric acid alternating with permanganate of potash solutions. Urine first passed per urethram on the twenty-first day. Thirty-one French sound introduced through the urethra into the bladder once a week. Fifty-sixth day all urine passed through urethra. Upon leaving the hospital this patient had gained in weight and strength. The pain and discomfort connected with his urinary apparatus had disappeared. His urine contained only a few pus cells. Four months after operation patient states that his general health is fair. Urination is performed with comfort. His urine is for the most part clear. It is passed with a frequency only slightly greater than normal. Patient lives in another state, hence the amount of residual urine cannot be determined.

On Feb. 24, 1903, this patient reports himself greatly improved in general health. He states that as far as his urinary organs are concerned he is conscious of no discomfort whatever.

In all the cases observed after an interval sexual desire has been absent or notably diminished. Erections have either been absent or feeble.

## CASE OF BOTHRIOCEPHALUS LATUS IN A WOMAN IMMIGRANT, WITH REMARKS ON THE OCCURRENCE OF THIS PARASITE IN AMERICA.*

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Mrs. Weiss, born in Russia, female, forty-six years old, married, with several children. She applied at the Good Samaritan Dispensary in November last for treatment for a tapeworm. She had been in this country a few years. Had been passing segments of worm for years before her arrival (eight years in all, to her own knowledge), but had been so little inconvenienced that, to use her own words, "she thought she would wait to be treated till her children were grown and she had more time." She looked well-fed and plethoric, and complained only of vague digestive discomfort.

Oleoresin of male fern, preceded by the usual regimen, promptly expelled the worm complete.

I have been able to find no authentic notices in medical literature of a case of *Bothriocephalus* unquestionably of endemic origin in the United States or Canada, though it is said (authority not perfectly satisfactory) to be common in Mexico. George Dock (American System of Practice of Medicine) has observed three cases, two in Texas and one in Colorado, all imported. He knows of no endemic cases. Osler's account is to the same effect. Max Braun, in the last edition (1902) of his Thiersche Parasiten mentions a single case, reported from Philadelphia (without reference to the authority quoted or statement whether or not the case was imported).

I have observed in the last three years three other cases of *Bothriocephalus* (or *Dibothriocephalus*, as Braun writes it, returning to the original name), all among the same class of Russian immigrants. All of these patients enjoyed comparatively good health, with no special evidences of anemia, and no symptoms other than indefinite distress in the belly. One, a girl of nine years, had been brought by her parents to this country three years previously. The parents were positive that she had never passed tapeworm proglottides till three months before I saw her. I believed at first that I had discovered a true endemic case, but afterward concluded that the mother was too ignorant to serve as a credible witness. This case has therefore been classified with the others.

*Note.*—Dr. James Ewing mentioned in the discussion that he had reported to the New York Pathological Society some years ago an imported case of three worms in one patient, a Swede. Dr. Theodore Janeway also mentioned a case recently in his own care, imported, in which there were no signs of anemia.

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## HERNIA.*

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Hernia, being synonymous with Rupture, is applied in general terms to the escape of any viscus through a congenital or pathological opening from the abdominal cavity where it is naturally contained.

Some herniæ are rare and will not be considered in this paper. Only inguinal, femoral and umbilical herniæ are under discussion because of their pathological importance, the frequency of occurrence and amenability to treatment.

The inguinal herniæ are of two varieties, oblique and direct.

The oblique or external may be congenital or acquired, and due to a predisposing weakness or imperfection in the tissues comprising the inguinal canal, *i.e.*, such as the non-closure of the vaginal process of the peritoneum following the prenatal descent of the testicle, and such herniæ are a frequent accompaniment of cryptorchism; another cause being the possible adhesion of a viscus to the peritoneal covering of the testicle

* Read at the Annual Meeting of Rockland County Medical Association, Nyack, Jan. 21, 1903.

within the abdomen, the descent of which causes a hernia to be drawn down with it.—(Sultan "Abdominal Hernias," Ed. by Coley.)

There are a number of anatomic peculiarities of congenital inguinal hernia, recently described by Bayer, which I need not enter into here (*loc. cit.*).

The acquired oblique hernia always follows the course of the inguinal canal with the spermatic cord and its vessels, and may stop at any point in its descent. When it does not appear at the external orifice it is termed incomplete and called a bubonocele. If, however, it passes through the external ring, it becomes *complete* and usually descends into the scrotum.

The fine anatomic distinctions of herniæ serve but to confuse and need not occupy our attention as they possess no particular consideration of a practical bearing upon treatment.

The direct or internal inguinal hernia protrudes directly through the internal inguinal fossa, being the space at the outer side of the rectus, which has no muscular covering, so that, in advancing years and relaxation of the abdominal parietes, a hernia bringing a portion of the relaxed abdominal wall before it can easily protrude at the external abdominal ring.

There is no preexisting canal here, hence this variety of hernia is never congenital and occurs only in adult or advanced life, being usually acquired as a result of chronic bronchitis or some other cause increasing intra-abdominal pressure. They are globular in shape, frequently bilateral, and seldom scrotal.

*The Importance of Hernia.*—The inguinal and femoral are the most common types, and their frequency depends upon sex, age, occupation and locality. Without going into elaborate and detailed statistics quoted by various authorities, the ratio of ruptured persons is about 1 to 15 in men and 1 to 40 in women (Agnew). More recent European statistics give 4.4 per cent., ranging from 19.6 per cent. in the first year to 1.14 per cent. in the fifteenth year. (Berger.) As this affliction is responsible for the lessening of the earning power of the individual by 10 per cent., with a reducible hernia perfectly retained, it can be somewhat appreciated what the large number of affected cases means in the unequal struggle for maintenance, to the sufferer and his family, and to the industrial economy of the State; and correspondingly greater if the hernia is retained with difficulty, is irreducible or of large dimensions. (Sultan.)

*Etiology.*—Predisposing factors are seldom if ever wanting, such as anatomical weakness and defects of a congenital nature. Malformations, as a subperitoneal lipoma acting as a wedge and making traction on the peritoneum, producing a true hernial sac. An ectopic testis is usually accompanied by a hernia. Other causes I have previously referred to.

Heredity is certainly a remarkable element and frequently observed in the hospital clinics, where several members of the same family are subjects of hernia.

Chief of the exciting causes is increase of intra-abdominal tension, coupled with a congenital predisposition; straining at stool, sneezing, lifting, blowing wind instruments, logging, long and exhaustive marches, tight belts, *especially in infancy;* the sitting posture, favoring weakening of the abdominal muscles. Phimosis in infants causing reflex irritation of the vesicle neck in straining to micturate. The development of the hernial sac is favored by rapid emaciation, and also by the accumulation of fat, and excessive length of mesentery. Traumatic herniæ are infrequent because there must have already existed a congenital sac.

*Symptoms.*—Many cases of acquired hernia, of the inguinal oblique and femoral varieties, are unable to give a definite history of onset, while others can define the sensations occurring subjectively when the hernia is produced by some physical exertion. There is usually a feeling of something having suddenly given way, a stinging or burning sensation in the locality, while the pain may be referred to some distant part, as for instance to the umbilical region. There may be nausea and a feeling of faintness, followed rapidly by graver indications.

The objective symptoms may be wanting, but cases have been reported where a viscus has been protruded, and produced immediate strangulation.

All herniæ produce discomfort, with frequently more or less local and reflected pain and colic; dyspeptic symptoms; a sensation of weakness and insecurity upon exertion; difficulty in rising from sitting posture and maintaining an erect position; inability to endure enforced or prolonged fatigue; an altered sensation down the legs, due to the pressure of the hernia or a truss pad on the ilio-inguinal nerve; often a coldness; sometimes partial anesthesia; the bowels are frequently constipated and irregular; and pain is experienced at stool. Bladder symptoms usually exist in old and neglected cases; and the mental condition of the patient is often one of depression, introspection and self-consciousness. The symptoms of an irreducible or incarcerated hernia may be all those enumerated above and frequently exaggerated. In cases of strangulation all degrees of intestinal obstruction are present from those of a mild type (where only omentum may be strangulated) to the more profound, with shock, rapid pulse, subnormal temperature, vomiting, obstipation, and abdominal pain are present.

*Diagnosis.*—The first point in diagnosis of inguinal hernia in the male is to ascertain if the testicle and cord are in the scrotum. If in the inguinal canal, whether they can be brought down into the natural repository or reduced into the abdomen. If the latter, by invaginating the scrotum with the finger (or the loose tissue of the mons in the female), to ascertain whether the orifice is above or below Poupart's ligament. If

below, it is femoral; if above, an inguinal oblique. Should it be internal to the inguinal canal in an elderly person, with a history of acquiring it after middle life, in shape oblong or globular, and not scrotal, it belongs to the direct variety.

If a moderately sized hernia, located in the groin, what other affections may it be confounded with? If the tumor is in a male and reducible, it is most likely an inguinal hernia, as the hernial orifice can easily be determined, as indicated, in most subjects; yet in a very fat woman it is often difficult to determine whether the orifice is above or below Poupart's ligament.

Again, in very large scrotal herniæ, to which side does the hernia belong? When reducible the side to which the hernia can be made to return, and the location of the testicles will serve as reliable guides, as the testicle of the healthy side remains in the proper position, while the other is posterior and pushed downward.

Nearly all scrotal herniæ in infants and children appearing soon after birth are congenital.

An existing hernia, reduceable through the internal inguinal ring, the canal being empty at time of examination, can be diagnosed by a slight amount of abdominal fluid perceptible in the hernial sac, felt in the course of the canal, the patient being in the upright position.

In adults the increasing size of a hernia gradually dilates the inguinal canal and finally causes it to lose its oblique direction, often making it difficult to determine an oblique from a direct hernia. The latter usually stops at the root of the penis and rarely descends into the scrotum.

As an inguinal hernia can be mistaken for a retained or dislocated testis, swollen lymphatic glands, psoas abscess, a subperitoneal lipoma, cyst of the round ligament and frequently for a hydrocele of the cord, it is important to be able to differentiate these conditions.

We should commence with inspection by systematically examining the patient after a careful history and cross-questioning which will furnish subjective information. Does the tumor correspond to one of the hernial openings, and has it a pedicle attached within the abdomen? Does it change with the position of the patient, and is the impulse exaggerated by coughing? In palpating the tumor, does its base enter the orifice within the abdomen, or can it be separated by the thumb and finger?

Among the surest signs of hernia are its reducibility, tympanitic sound, and gurgling on manipulation when bowel is involved. If omentum, it has a doughy feel, lumpy, and reduction more difficult, with absence of gurgling. When incarcerated, the diagnosis is more difficult, yet the antecedent history of the case helps to confirm the diagnosis.

As all abdominal herniæ are subject to the same general laws it does not seem necessary to go into details regarding the recognition of the others, as anatomical landmarks serve to give them a name. The following are the main features of *inguinal hernia* and *hydrocele testis:*

| | |
|---|---|
| ANAMNESIS. | |
| "The tumor appears suddenly during an augmentation of the intra-abdominal pressure; or gradually, in which case the swelling is first noticed in the abdominal wall and the enlargement is toward the testicle. | The swelling develops more slowly, not rarely after a contusion of the scrotum or inflammatory changes in the epididymis.<br>The swelling commences in the bottom of the scrotum and gradually spreads toward the abdomen.<br>With a single exception (hydrocele communicans) they do not suddenly change in size. |
| INSPECTION. | |
| "The swelling seems to be directly continuous with the tissues of the abdomen.<br>"The swelling is not translucent; in rare cases, in very young children, it may be translucent. | The swelling is usually sharply circumscribed from the abdomen.<br>The swelling is translucent; if the walls are very thick, or if spermatic fluid or blood is present, it may not be translucent. |
| PALPATION. | |
| "If an attempt is made to draw the tumor away from the abdominal wall between the thumb and index finger, a portion of the tumor is felt passing into the abdominal cavity.<br>"The tumor may be replaced. | If the same attempt is made nothing is felt between the tumor and the abdominal wall but the constituents of the spermatic cord.<br>The volume of the tumor remains unchanged upon pressure (with the exception of a hydrocele communicans). |
| PERCUSSION. | |
| "Under certain circumstances, a tympanitic note is obtained."—(*loc. cit.*) | Always dull upon percussion. |

*Prognosis.*—The common forms of all abdominal herniæ tend to recovery by mechanical means during the first two years of infancy.

After the child is able to run about in the erect posture, mechanical treatment becomes less efficient and cures are the exception instead of the rule. There are many reasons for this. An active child rebels against the irksome restraint of even the best fitting truss; carelessness upon the part of parents, in their attentions, and often an improper appliance is worn.

Prognosis in the operated cases depends upon the conditions, the kind of hernia, age, etc.

Operations of election by the Bassini method in inguinal hernia are seldom failures, and a death in one to 300 to 500 is quite a high rate of mortality. Recurrences in femoral are occasionally seen. Umbilical will furnish the highest death-rate because of the class of subjects afflicted, corpulent, full habit, with poor heart and kidneys. The mortality in strangulated cases depends, like appendicitis, on the time of operation.

*Treatment, Mechanical and Surgical.*—The management of hernia to-day is tending more toward the radical than ever before, because of the safety of operation in a death-rate of infinitesimal proportions, the decreased likelihood of relapse since the newer methods have devised a secure operative procedure, and the short time spent in confinement to bed (being about ten days), the percentage of cures being one-hundred in those cases of primary union in healthy subjects.

Yet, no matter how much advance there may be in the art of surgery, the mechanical treatment of this affliction must always remain the chief source of relief to the vast majority of sufferers. The reasons for this are so obvious to us all when a patient consults us that to give them, to emphasize the statement recorded, would be superfluous.

To all infants with uncomplicated conditions the application of a properly selected and well-fitting truss, coupled with a reasonable intelligence of the mother or nurse, will effect a cure within a year or eighteen months in 90 per cent. of all cases, under safe-guarding observation by the medical attendant. This is because the inguinal and umbilical herniæ are most amenable to such treatment, and usually are the only varieties met with in this period of life.

Recumbency of the little patients prevents the hernia descending through the patulous orifice except in straining, when the pressure of a truss *over the ring* affords necessary protection. Recovery takes place not by any occlusion of the sac or by adhesive inflammation, as has been generally concluded, but by a true retraction of the sac within the abdomen.

I will not enter into the history of trusses, which is very interesting, as space does not permit, but state my reasons for the rejection of the ordinary forms on the market, and the ones usually sold by the dealer or selected by the wearer.

The German and English patterns are mostly used, and I cannot express my condemnation of them in sufficiently strong terms, because the pad, resting as it does on the pubic bone, allows the hernia to protrude through the internal inguinal ring, acting constantly as a dilating wedge in the whole course of the inguinal canal. Its prolonged use tends to enlarge the opening and eventually causes the internal ring to widen down into the external, until it becomes one immense aperture into the abdominal cavity. Therefore all possibility of a cure resulting spontaneously from a proper retention of the hernia is absolutely removed, and the condition made worse.

This objection applies to most of the different forms of continuous spring trusses where the pads are placed upon descending arms and exert the pressure in a direction that invariably enlarges the hernial openings and canal.

Sir Astley Cooper, in the early part of the last century, appreciated these defects. He stated: "The object in applying a truss is to close the mouth of the hernial sac, and destroy its communication with the abdomen, and this object can never be perfectly fulfilled by any truss which is applied upon the external abdominal ring."

"The essential requisites of a good truss," says Holmes (Syst. Surg.) "are these, that it should fit easily, should not shift by any movement of the patient's body, not gall the skin, or any part project against the abdominal wall; its pad should cover the hernial aperture and its pressure should be directed properly, and should be great enough to prevent the descent of the hernia in any position or exertion which the patient may make; but it should not be so severe as to cause enlargement of the opening; the pads should be supported with the least possible force or the application will become irksome. . . . Variations in pressure are very essential in order to adapt it to different circumstances; finally the direction in which the pressure is made must correspond to that of the inguinal canal."

The cross body or Marsh truss and the Hood pattern meet these requirements admirably. The former includes fully two-thirds of the body, and is applied from the opposite side; the points of pressure being over the internal inguinal ring and the gluteal muscles of the affected side by a counter-pressure pad on the distal end of the spring. When shaped to the individual form it is worn with comparative comfort and security. The pad and pressure should be suitable to the case under treatment. This truss is best suited for femoral hernia as well as inguinal oblique.

The Hood truss is an encircling spring with solid front, carrying one or two hernial pads, and open at the back, being fastened by a short connecting strap. The spring being of German silver is readily malleable, and when these trusses are covered with an impervious material they are cleanly and comfortable. This truss is so shaped that it passes about the pelvis at the most immovable point, and is, like the cross-body, entirely out of the way of the muscles of locomotion, allowing perfect freedom in all movements of the body.

These two forms of trusses are efficient, and combine security with ease of wearing when properly fitted, being suited to all ages and conditions that admit of a hernia being retained by mechanical means.

Belt trusses are only mentioned to condemn, as they constrict the hips, giving very little pressure over the inguinal region where it is most needed. They have a place as a night truss, when it becomes necessary to employ one where a persistent cough is present. That patients afflicted with hernia who consult the average physician are not advised and treated as other medical cases are is manifestly true, the usual advice being "Go to the druggist and get a truss." This vague prescription is chargeable, to say the least, to listlessness of physicians, who thereby forfeit a kind of professional service, through inability to apply mechanical therapeutics for which they could justly claim compensation. By proper forethought the profession could instead reserve to its own members a pro-

fessional duty which now goes by default to druggists, who are seldom more qualified, and should be considered less so than the physician, to perform it. Infinitely more satisfactory for both patient and physician would it be if professional selection and guidance were exercised for the sufferer's benefit in the proper adjustment of a suitable appliance. The whims and prejudices of patients, and their crude ideas formulated from the continual failures and discomforts of badly fitting trusses, as to what is needed for their cases, are seldom reliable guides in the selection of a suitable appliance.

In an address to the New York Medical Association meeting in 1889 Dr. Jos. D. Bryant said:

"The greater number of medical men of the present day are blissfully ignorant of the truss armamentarium now in the market, also of the measurement, means, and method of fitting them properly to patients. The patients thus afflicted are relegated to the 'instrument makers,' or to other mechanical agents for the proper (?) truss or appliance, and the application of it. In a large number of cases, no doubt, this course on the part of the medical man is actuated by the sense of his own inability to meet the demands of the case; when this is the true cause, while we may commend him for his sincerity, still we must respectfully submit that he is a much too willing exponent of the sentiment that teaches 'where ignorance is bliss 'tis folly to be wise.'"

Sir Astley Cooper gives these directions for fitting a truss: "Therefore, when a hernia has been returned by the surgeon into the abdomen he should lay his fingers obliquely above and to the iliac side of the ring and direct his patient to cough; and the farthest part from the ring toward the spine of the ilium, where the internal sac is felt to protrude is the point which should be noted for the application of pad of the truss and the instrument made accordingly."

*Fitting Trusses.*—I should not feel justified in occupying more of your time in speaking of trusses or enlarging my plea for a better understanding of the subject and the therapeutics of hernia generally, but will direct your attention to the practical side of the question of fitting them. I cannot do better than quote Prof. W. B. DeGarmo's rules for measurement and method of fitting, as given in a lecture delivered at the Post-Graduate Medical School: "After getting the measures, which should be taken by passing the tape-line around the pelvis, about two inches below the crest of the ilium, and over the internal ring, we should next secure the shape of the hips and place it upon paper, where it will be of real practical use in molding the spring for the patient. This is done by the aid of a strip of sheet-lead, half an inch wide and one-sixteenth of an inch thick, by about 20 inches long. I place this across the front of the abdomen with one end resting over the internal ring, we will say of the right side. The lead is now molded to the shape of the front of the abdomen, and around the left hip to the center of the back or a little beyond. Having been pressed to the exact shape of the surface of the body, it is now carefully slipped off from the left side and placed edgewise upon a sheet of paper of suitable size. Its inner surface is traced around by a lead-pencil, and the process is either repeated for the opposite side, or you may simply turn the lead over, thereby completing a tracing of the circumference of the pelvis.

You should now select the size and style of spring which you desire to use, and shape it to fit this tracing. If you select a cross-body spring, begin by shaping that portion which passes over the front of the abdomen to correspond to the diagram on the paper, and so follow around, of course allowing for compression. This method so far simplifies truss-fitting as to place it within the reach of every practitioner who is willing to devote the required time to the interest of his patient.

Springs covered with hard rubber must be warmed before bending. When you have supplied your patient with a good-fitting truss, you have not fulfilled your entire duty. The subsequent care of the case is of equal importance. I keep all children under care, having them come back at stated intervals until they are cured. Usually I see them not less than once a month. Do not allow the parents to decide whether attention is needed or not, but have them bring the child back, that errors may be corrected in the fitting of the truss which they would never see. Adults should be impressed with the importance of reporting three or four times every year, even after perfect fitting is secured, that you may decide whether they are wearing their trusses right, and that their hernias are being securely held in place.

In the care of the skin, to prevent excoriation, cleanliness is of the utmost importance. The truss as well as the person must be kept clean, and, as far as practicable, dry.

Before describing the surgical treatment of hernia, it might be considered in keeping with the scope of this paper to describe the methods best suited in using taxis for *recent* cases of strangulation.

Taxis, or restoration of the hernial viscus to the normal position by mechanical manipulation is termed reduction or taxis.

1. *Position.*—The body should be recumbent, the knees flexed, if necessary, or such attitude as to relax muscles of part. In femoral hernia the knee of affected side should be flexed obliquely, inclining to opposite side. In inguinal scrotal, place thumb and finger of left hand at the neck of tumor to prevent invagination of intestine and overlapping at orifice and guide its course through internal inguinal ring. Grasp body of hernia with right hand, draw carefully downward and outward, then gently compress tumor, equalizing pressure as much as possible, except that it should be greatest at bottom. Gurgling often manifests the fact that the hernia has re-

ceded.* Care should be taken not to reduce the testicle with the hernia, if adhesions connect the two together. The application of ice-bags, or hot fomentations of hops often assist in the taxis of recently strangulated hernia, also the hypodermic injection of atropine gr. $^1/_{25}$, into the constricted ring.

In femoral hernia the pressure on the hernial tumor must be made downward, to saphenous opening, and then upward. Long-continued and too often repeated efforts at reduction are frequently followed by inflammation, particularly so in this form of hernia.

The difficulty in exerting taxis on large umbilical herniæ in fat people is the tendency for the hernial viscus to slip between the fat and the skin or muscles; and in most of these cases the sac is adherent. Sometimes there is more than one opening, and this impression may be often formed from another condition of the "pocketing" of the hernia, to one side or other of the hernial orifice in the fascia or adipose tissue. Both hands should be used and placed around it, the manipulation being chiefly conducted by the thumbs and fingers in a rolling or kneading motion.

*Surgical Treatment.*—It is not my purpose to describe the various methods of operating for the relief and cure of hernia, as my paper is already too long. The great names in the history of surgery are attached to some personal technic for its treatment. The object formerly sought by a radical cure was the obliteration of the sac by some means; for it was firmly rooted as an established fact that this was the primary cause of hernia. The prejudices of the medical profession die hard, and it was not until Bassini, of Padua, read his paper before the Italian Congress of Surgeons in 1888, relating his 102 cases (seven of which were strangulated) without a failure and with no mortality, at the same time stating it was his belief that it was the anatomical defects in the inguinal canal and *not* the sac per se which were responsible for hernia; and in obliterating the canal as well as the sac lay the secret of radical cure, that this operation was accepted by the profession generally. Only about a month later Halstead, of Baltimore, published a new operation almost identical to that of Bassini, excepting that in his treatment the cord is external instead of below the sutured aponeurosis.

"Bassini aims, by his operation, to completely close the hernial canal within the abdominal wall, and to form a new canal for the cord which shall correspond as much as possible to physiological conditions. His radical operation is composed of three steps:

"First step: The pillars of the external abdominal ring and the aponeurosis of the external oblique muscles are exposed by an oblique incision corresponding to the course of the spermatic cord. The aponeurosis of the external oblique muscle is now incised up to a point above the location of the internal abdominal ring, separated from the underlying tissues, and the two flaps turned back to either side. The hernial sac is now separated from the spermatic cord by blunt dissection and completely isolated from the surrounding tissues, particularly in the vicinity of the neck of the sac, so that every trace of a funnel-like diverticulum disappears. After the hernial contents have been reduced, the sac is opened at some distance from the neck, and adhesions between the sac and contents separated, the protruding portions of omentum ligated in sections and extirpated, and the hernial sac ligated as high up as possible. The sac is then cut off one centimeter below the ligature and the stump is buried in the abdominal cavity.

"Second step: The isolated spermatic cord is lifted up and held to one side. The two flaps of the aponeurosis of the external oblique muscle are held back by retractors, and the whole mass of muscle situated internally—the larger upper portion, composed of the internal oblique and transversalis muscles, the smaller lower portion, composed of the rectus muscle—is united throughout its entire extent with Poupart's ligament by four or five mattrass sutures, so that only a sufficient opening for the spermatic cord is left in the upper and outer angle of the wound.

"Third step: The spermatic cord is laid upon the newly formed posterior wall of the inguinal canal, and the two flaps of the aponeurosis of the external oblique muscle are sutured over it, thus forming the anterior wall of the new inguinal canal.

"The operation is concluded by the suture of the cutaneous wound."*

The importance of the Bassini technic lies in closing the space or bed of the spermatic cord and vessels, and making a true posterior wall that formerly was deficient. All former operations omitted this important feature, which insures against relapses. It is a most remarkable fact to think that all the great surgeons of the past never fully appreciated wherein their operations were defective, and the security this one feature of the surgical procedure in curing hernia would give in preventing recurrences; lifting the considerations of prognosis from doubt and uncertainty to one of promise and future safety.

When dealing with an ectopic testicle where the short cord prevents its descent into the scrotum, a pocket can be made in the subperitoneal space posterior to the lower portion of the rectus, and the testicle placed there where it has the protection of the lower abdominal wall.

The after-care of these cases is ten days in bed, allowing them to return home in two weeks, the wearing of a snug abdominal band of Canton flannel with perineal straps for six weeks.

In operating on femoral herniæ, the incision is made over the tumor longitudinally, exposing the

* Article of W. H. Bennett, F.R.C.S., in Lancet, Aug. 20, 1892, "Dangers of Indiscriminate Attempts at Reduction of Strangulated Hernia by Manipulation."

* This concise description is given by Sultan.

hernial sac, reducing its contents, ligating it as high as possible, and excising it.

The closure of the ring is best accomplished by passing the sutures through Poupart's ligament, the pectineal fascia, and the periostum of horizontal ramus of the pubis.

*Umbilical Hernia.*—The tendency to this form of hernia in young children and infants to spontaneous cure when appropriately treated makes the surgical treatment rarely necessary. A gauze pad fastened by a strip of adhesive plaster encircling the abdomen and changed as required, usually effects a cure. The parts should receive proper antiseptic cleansing, the gauze sterile and some non-irritating and slightly antiseptic powder applied.

The surgical treatment is reserved to the strangulated, incarcerated, and large herniæ of adult life.

A marked advance was made by Gersuny, who suggested opening the sheaths of the recti, and uniting the internal borders of these muscles as well as the usual sutures of the hernial orifice. It is always well to perform omphalectomy and the overlapping of the muscles, as recommended by Blake, of New York, give the best results (*loc. cit.*)

*Report of Cases.—Case 2359.*—A. T., male, aged five years, right inguinal oblique. Duration since six weeks old. Operation at Post-Graduate Hospital, disclosing congenital sac. Bassini method. Primary union. Left hospital on fourteenth day.

*Case 2361.*—E. R., male. Right inguinal oblique scrotal hernia observed at fourth month. Ectopic testicle. Operation at Post-Graduate Hospital July 17. Bassini operation. Cord too short to allow of testicle being placed in scrotum. It was dealt with as described above. Primary union. Left hospital on fourteenth day.

*Case 2373.*—H. D., male, aged two years. Left inguinal oblique scrotal. Duration since birth. Size of small egg. Acute strangulation. Operation at Post-Graduate Hospital July 21. Primary union, leaving hospital on fourteenth day.

*Case 2375.*—I. M., female, aged twelve years. Double inguinal oblique. Duration ten years. Operation at Post-Graduate Hospital July 28. Primary union, leaving hospital on fourteenth day.

*Case 2382.*—L. McN., aged ten years. Right inguinal oblique. Contents omentum, congenital sac. Duration since infancy. Operation at Post-Graduate Hospital, August 19. Primary union, leaving hospital on fourteenth day.

Case (Private).—Geo. McK., aged thirteen years. Right inguinal oblique, congenital. Duration since infancy. Boy poorly nourished, weighing 84 pounds. Operation at patient's home, assisted by Dr. Maynard, on August 20. Some slight gaping of skin wound and sluggish healing, requiring confinement to bed for two weeks. This did not affect the result of operation and patient had a perfect recovery and rapidly put on flesh weighing 113 pounds in five months.

*Case 2400.*—D. H., male, aged twenty-eight years. Epigastric hernia in linea albi one inch above umbilicus. Duration, 3½ years. Content omentum. Operation September 23, at Post-Graduate Hospital. Closure of hernial openings (two) with Kangaroo tendon opening sheaths of recti and bringing edges of these muscles together over the sutured apertures. Primary union, patient leaving hospital on fourteenth day.

*Case 2404.*—L. P., female, aged thirty-three years. Right inguinal oblique. Duration four months, caused by coughing soon after a confinement. Operation at Post-Graduate Hospital, September 30. Primary union, leaving hospital on the fourteenth day.

I wish to acknowledge my indebtedness to the assistance I have derived from the writings of DeGarmo, Cooper, Heaton, Holmes, Agnew, Gross, Bryant, and Sultan, in the preparation of this paper. I have freely made use of quotations in some instances from these authors, full credit for which I wish to make herewith.

## THIOCOL.*

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Ever since the efficacy of creosote was established in pulmonary affections, the medical profession have been striving to find a derivative of this coal-tar product which would be free from the unpleasant properties and effects of that drug. Both guaiacol and creosote act as irritants and even caustics on the mucous membrane of the entire alimentary tract. Besides this, they have an unpleasant odor and taste, on account of which the patient receives them with repugnance. They are both to all practical purposes insoluble in water, but are somewhat soluble in a 50-per-cent. solution of alcohol; however, such a solution is irritating in itself, owing to the alcohol, liability to excite coughing and leaving a sensation of burning in the throat which remains for some time after its ingestion. On account of these facts the different acid esters of guaiacol have been substituted, but while in some instances they are tasteless, yet they are all insoluble in water, and moreover are not broken up into their compounds in the stomach, but merely undergo a partial decomposition on reaching the alkaline intestinal secretions, consequently they are but a poor substitute.

More recent investigations into the synthetic chemistry of the diatomic phenols have given rise to a more successful compound of guaiacol that

* (Guaiacol—sulphonate of potassium Roche.) A soluble form of guaiacol, its uses and advantages over the insoluble derivatives of creosote, such as guaiacol, duatol, and other diatomic phenols.

is readily soluble in water, free from the taste and obnoxious odor of creosote, non-toxic, and extremely assimilable. This new preparation is called thiocol, the potassium salt of orthoguaiacol-sulphonic acid. The formula may be represented by $C_6H_3.OH.OCH_3.SO_3K$. It occurs as a white micro-crystalline, odorless, permanent powder, of a faint bitter-saline but not disagreeable taste. It is readily soluble in water and dissolves also in dilute alcohol, but it is insoluble in ether or in fatty oils. Its aqueous solution is colored blue by ferric chloride, the color changing to wine-yellow on the addition of ammonia water. Thiocol has a powerful reducing action on silver salts and ferric compounds, and at once decolorizes permanganate solution.

After the administration of thiocol, almost the total amount of sulphur from the medicament is found in the urine as sulphate, with a small proportion of guaiacol-sulphate.

The physiological action of creosote is purely as an antiseptic. It is an excellent preservative, for meat can be kept in it indefinitely. This feature, however, has always been a drawback to its exhibition in large quantities for any length of time, as it deranges the stomach and finally renders that organ unfit for work.

According to the physiological experiments made by Dr. G. Rosebach at the Medico-Chemico Institute connected with the High School at Berne, Switzerland, and by Prof. Jaquet at the Medical Clinic of the University of Basle, Switzerland, thiocol, when given per os or injected subcutaneously, is non-toxic, producing a striking increase in weight and showing no injurious effect upon the composition of the blood.

In most cases they found an increase in the number of blood corpuscles and the amount of hemoglobin; in others the quantity remained unchanged. Furthermore, the animal experiments proved the extreme assimilability of thiocol as against other guaiacol compounds—where only 7 per cent. of guaiacol was absorbed, 70 per cent of thiocol was assimilable.

The advantages of thiocol, then, over other guaiacol preparations are, after its tastelessness and freedom from unpleasant odor, its free solubility in water and permanence in the air which allows it to be dispensed as powder, tablet, or in solution; its high percentage of absorption and its non-toxicity when administered either by mouth or by hypodermic injection.

Having thus found a substitute for creosote which, besides having its antiseptic properties, is free from those objectionable features of the creosote itself, and moreover having additional advantages of its own, let us look at the pathologic conditions in which it is indicated, so that a clearer and more intelligent idea of why it produces certain effects may be obtained, and not give it simply on account of the old maxim "Post hoc, propter hoc."

As every pathologic lesion must be preceded by a change in function, we find that in the inflammatory diseases of the respiratory tract they are preceded by a hyperemia, this hyperemia usuall being induced by exposure to cold, or by irritating particles in the inspired air. The hyperemia is soon followed by a mucous exudate which is later augmented by leucocytes and red blood corpuscles, which, unless thrown off by coughing, form a nice nidus for the development of germs.

The process which, until this point has been limited to the mucous and submucous membrane of the bronchi and bronchioles, if not arrested proceeds by continuity of structure to the surrounding tissues (the parenchyma), and the inflammation becomes more intense; at the same time pressure from the accumulated products of inflammation so press upon the blood vessels that anemia now takes the place of hyperemia and degenerative changes occur, such as hepatization, yellow atrophy, caseation, etc.

Besides this, the toxins which are formed by the bacteria that gain entrance into this excellent culture medium and thrive there luxuriantly, affect profoundly the nervous system and also exhaust the valiant white blood corpuscles in their strenuous effort for supremacy.

This general picture covers the entire field of pathogenic changes from a simple acute bronchitis, through chronic bronchitis and pneumonia, up to pulmonary phthisis, the different forms of bronchitis depending only upon the severity and length of the attack; while the pneumonia and phthisis are due to their respective specific germs and the anatomy of the part affected.

Tuberculosis of the lung is probably the most exhausting of all diseases and the most difficult to arrest, because the bacillus, which forms the toxic ptomains that sap the patient's vitality, is surrounded by impregnable walls of connective tissue that shut off all approach from the blood current. However, it is not only the tubercle bacillus that is at work undermining the constitution, but the staphylococcus and streptococcus, which linger more superficially in the mucous membrane and around the walls of cavities, producing a septic condition that we call the mixed infection, and which is accountable for untoward results and neurasthenic conditions.

The first and most important feature, then, after the invasion, is the germ and this calls for an antiseptic; the pyrexia, night-sweats, nervous symptoms and pain, are due to the accumulation of the products of inflammation and toxins. These are at first prevented from further elaboration by arresting the process of inflammation and killing the germ that produces them; then such material as remains must be filtered out from the blood through the bowels and kidneys by means of purges and diuretics. The accumulations in the air-passages will be removed reflexly by coughing aided by stimulating expectorants, and the irritated mucous surfaces must be soothed and gently stimulated to produce their natural secretions, so that harmonious interchange between the air and blood can take place in the alveoli. After all these things have been accomplished the nervous system must be toned

up, the broken-down tissues rebuilt, and the exhausted leucocytes rejuvenated. When all of this has been accomplished, then, and not until then, is our patient cured. It will at once be seen that in thiocol Roche we have a remedy combining all the factors necessary for such results, in consequence of its non-irritativeness and non-toxicity it does not give rise to untoward symptoms of any kind, not even with continued use; owing to its great assimilability, it affords the possibility of successfully combating phthisis, causing such symptoms as emaciation, anorexia, decline of strength, fever, night-sweats, etc., to disappear in a short time, quicker than any other medicament hitherto used in phthisis, and the clinical testimony of authorities, both in Europe as well as in America, upholds this theoretical exposition most satisfactorily.

The rationale of the favorable action of all creosote preparations in pulmonary affections is not yet definitely elucidated, and should receive further investigation.

Dr. Andrew H. Smith believes that the nascent creosote liberated in the intestinal canal, circulates in the blood and has a direct exterminating effect upon germs wherever it comes in contact with them. Some observers believe that the entire body is permeated with the antiseptic material that is thus introduced, and thus bacteria causing various diseases are met and destroyed. Others claim that the action of the creosote preparations is simply that of a neutralizer of the toxins produced by the bacteria. Whether it be merely a restriction of the development of the bacteria or complete annihilation of them, the fact remains that after the exhibition of thiocol, the toxic manifestations are greatly reduced.

My own experience with thiocol has been quite extensive and varied. I have used it in acute and chronic bronchitis, pneumonia, and more particularly in phthisis pulmonalis in which latter disease I have observed its action in over 20 cases.

Resolution in bronchitis I found to take place much sooner than usual, and in pneumonia the temperature could be reduced 4 degrees in twenty-four hours; the areas of dulness and the bronchial breathing rapidly diminished, and free and easy expectoration was established phenomenally early.

In tuberculosis the night-sweats were stopped almost from the first, the fever was markedly reduced, expectoration made easier and less purulent where mixed infection existed, while the cough became less persistent and annoying. The most marked effect, however, was upon the general condition of the patient. There was less nervousness, better tone to the nervous and muscular system, the appetite was stimulated and asimilation improved. At no time was there any derangement of digestion or irritation of the stomach. The dose varies according to the severity of the disease. I usually give thiocol three times a day, starting with 5-grain doses and gradually increasing the dose each day, especially in phthisical cases, until a maximum of from 30 to 45 grains is reached.

In thiocol Roche we have an elegant and efficacious creosote preparation that bids fair to be one of our most valuable modern therapeutic agents, and, in closing, I can give no more worthy testimony of its efficacy than by simply quoting a few cases of phthisis in which I have used it:

*Observation I.*—Mrs. P. S., aged thirty-one years, took a severe cold, one year ago, followed by bronchitis; had night-sweats and hectic fever; heart is excitable and irritable; both lungs consolidated with crepitant and sibilant râles throughout, expectorates a good deal; sputum shows the presence of the tubercle bacillus. She was put on thiocol in doses of 5 grains 3 times a day and this was gradually increased by one grain each time until she was taking 10 grains at a dose, making in all a total of 30 grains *per diem*. The night-sweats gradually disappeared as well as the fever, so that at the end of one month she had no night-sweats, scarcely any fever, the râles were less sonorous, expectoration was lessened, and she had gained somewhat in weight. She is still under observation and steadily improving.

*Observation II.*—Mr. H. B., aged fifty years, whose mother died of consumption at forty-four years of age, also one sister who died of consumption at the age of eighteen years; had grip and bronchitis two or three years ago; since then has coughed and expectorated a great deal; has had many hemorrhages, is nervous and impressionable; there are many old pleuritic adhesions at the base of the left lung with dulness at the apex. Right lung is consolidated at the back for almost its entire length; in front crepitant râles can be heard; has a temperature of 102° F. and night-sweats. He was put upon thiocol in 5-grain doses which was gradually pushed up to the maximum of 45 grains a day, with the happy result of reducing the temperature to 99.2° F., lessening the expectoration, and alleviating the cough; the night-sweats disappeared after the fourth day of treatment. He has gone south to avoid the bad weather, but is keeping up his treatment with thiocol.

*Observation III.*—Mr. E. C., aged twenty-seven years; parents both living; four years ago had bronchitis; aspect florid; is impressionable but not very nervous; number of respirations, 18; pulse 82; temperature 99.5° F.; digestion fair; right lung crepitant and sibilant râles at the apex, the entire base consolidated and at a point posteriorly, the evidence of an old pleurisy; at the apex of the left lung, there was a lesion which was the cause of blood in the sputum; he coughed a great deal and raised much thick sputum, which was occasionally tinged with blood; had night-sweats and hectic fever. He was put upon 5-grain doses of thiocol three times a day, which was gradually increased to 10 grains three times a day. His temperature dropped to normal, the night-sweats left him, the expectoration became thinner and ceased to

be tinged with blood, his cough was lessened, he slept better, his appetite increased, and he put on flesh. He is still taking thiocol and there is hope of further improvement in his case.

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## ON THE PRESENCE OF SPECIFIC COAGULINS IN THE TISSUES OF VERTEBRATES AND EVERTEBRATES.*

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In previous investigations† I found that the blood-plasma of the lobster coagulates under the influence of a piece of fibrin of the lobster, and that a piece of the muscle of the lobster has a similar effect. The fibrin of the blood of rabbits or rats, or the muscle of frogs, were without effect. I concluded that these facts point to a multiplicity of fibrin ferments in different species, and to a similarity or identity in different tissues of the same species of animals. "This specificity in the one case and the want of it in the other case corresponds to a similar specificity and want of specificity which has been found to exist with the precipitins obtained through injection of certain body fluids or albuminous substances into different species of animals."

I further investigated if a specificity of the substances causing coagulation existed also in the tissues of vertebrates. In a preliminary communication "On the Coagulation of Blood in its Relation to Thrombosis and the formation of Fibrinous Exudate,"‡ after an investigation of different classes of vertebrates, I published briefly, among other results, the fact that the same specificity of the tissue coagulins was found to exist in vertebrates and evertebrates. Since Woolridge's investigations it is known that extracts of various animal tissues have a marked effect on the coagulaton of the blood. Delezenne found that contact with the liquids and tissues of the wound has a decidedly accelerating effect upon the coagulation of the outflowing blood in birds. The blood of birds collected in the extract prepared from certain tissues of birds coagulated much more rapidly than it would have done otherwise. He found that extracts of other than bird tissues were less active, and believed that this marked activity of the tissues of birds compensated for the slow coagulation of bird's blood which takes place if contact of the blood with the tissues is avoided.

Conradi, who recently compared the influence of tissue extracts on the coagulation of blood before and after autolysis had taken place, seems to have assumed the existence of an approximately equally strong influence of extracts of fresh tissues upon the coagulation of the blood. A few weeks before my second paper on the coagulation of the blood appeared Hewlett published the observation* that an extract of goose liver did not have an accelerating effect upon the coagulation of dog blood. An extract of dog liver, however, did have an accelerating effect upon the coagulation of bird blood. He looked on this fact as suggestive ("Andeutung") of a specific action of the tissue extract of birds.

I now wish to state briefly the result of several series of experiments in which, in each case, the influence of tissue extracts of different classes of animals was tested upon the blood of a mammal, bird, reptile, amphibian, and arthropod. Only such a comparative investigation is able to demonstrate the specificity of the action of tissue extracts upon the coagulation of the blood.

1. *Experiments on the Blood of Rabbits.*—The following extracts were tested on rabbit blood: rabbit muscle, rabbit liver, cat muscle, cat liver, guinea-pig muscle, guinea-pig liver, pigeon muscle, pigeon liver, and, as a control, 0.8 per cent. sodium chlorid solution was used; the influence of the blood-clot and serum of the pigeon and guinea-pig, and of the serum of the rabbit were also tested. In each case 2 c.c. blood obtained from the carotid of a rabbit through a canula were received in 4 c.c. of the different extracts or of sodium chlorid solution containing the serum and blood-clot, or of a pure sodium chlorid solution. In five series of such experiments identical results were obtained. No marked difference between the action of the blood-clots or blood-sera used was found to exist. Among the tissue extracts, however a typical difference was present. Extracts of rabbit muscle and rabbit liver were by far the most powerful in causing coagulation of rabbit blood. All others were decidedly weaker, occasionally even less effective than a pure sodium chlorid solution. No marked difference between the extracts of the liver and of the muscle of the various species was found to exist.

2. *Experiments on the Blood of Birds.*—A large number of experiments were made with goose blood. In this case the method employed was somewhat different, inasmuch as the blood plasma was used and in most cases not extracts of tissues but solid pieces of the tissues were employed. The tissues of birds were found to be the most effective ones in causing coagulation. Among the tissues of various birds no marked difference in efficacy has been found so far. Among the tissues of other classes of animals typical differences were found to exist. The tissues of the cat and also of the dog were found to be much more active than the muscle of the guinea-pig and of the frog. The blood-clot of birds, however, was not more active than the clot of mammalian blood.†

3. *Experiments on the Blood of Turtles.*—In these experiments large turtles had to be used be-

* These investigations were carried out under a grant from the Research Fellowship Fund of McGill University.
† Biological Bulletin, Vol. IV, No. 6 (May, 1903), fully in Virchow's Archiv, Vol. 173.
‡ Montreal Medical Journal, July, 1903.

* Archiv. f. Pharmacologie u. experim. Pathologie, June, 1903.
† For further results obtained on the blood of the goose, I refer to my paper in the Montreal Medical Journal, and to the full paper which shall appear later.

cause in small turtles the blood flows out too slowly. For want of material only two experiments have been made so far. One c.c. of the blood of the turtle was collected in 2 c.c. of the extracts. Turtle liver, turtle muscle, rabbit liver, rabbit muscle, pigeon liver, pigeon muscle and 0.8 per cent. sodium chlorid solution were used. Extracts of turtle tissues were in these experiments the most active ones. In one experiment the difference between the tissues of the turtles and all other tissues was very pronounced; in the other experiment such a difference was still present though not so marked, presumably because in this latter case the blood was flowing from the animal at a much slower rate.

4. *Experiments on the Blood of Frogs.*—For these experiments bullfrogs were used. One-half c.c. of the blood was received in various test tubes containing each 1 c.c. of the extract. Extracts were prepared from guinea-pig muscle, rabbit muscle, rabbit liver, pigeon muscle, pigeon liver, frog muscle, frog liver, and as a control 0.8 per cent NaCl. solution was used. Seven experiments were made with identical results. Extracts of frog tissues were in each case by far the most active ones, all other extracts having not rarely even a somewhat inhibitory effect upon the coagulation of frog blood as compared with the action of a 0.8 per cent. sodium chlorid solution. Extracts from muscle and liver do not differ materially.

5. *Experiments on the Blood of the Lobster.*—Further experiments were made confirming and enlarging the results previously obtained. Various tissues and blood-clots of vertebrates were tested as to their influence on the coagulation of the lobster plasma. All vertebrate blood-clots and tissues were found to be without effect.

We see that the blood-clots of several species of vertebrates tested on vertebrate blood were not markedly different in their activity and did not show any specific influence upon the coagulation of the blood of their own species. With regard to the arthropods, however, the ferments contained in the various blood-clots become specific. The clot obtained from lobster-blood is active in causing coagulation of the lobster-blood. Clots obtained from vertebrate blood are ineffective, though the clot obtained from lobster-blood has a slight effect upon the coagulation of goose-blood.

These experiments prove the existence of *specific* coagulins in the tissues of all the species of animals so far tested. We may therefore speak of specific isocoagulins existing normally in the animal tissues, in so far as the coagulins are specific for the blood of the species from which they were obtained. The limits of this specificity remain yet to be determined. We saw that extracts of the tissues of rabbits, as compared with the action of guinea-pig tissue extracts, act specifically on the rabbit blood. We found, however, the tissues of the pigeon about as active as the tissues of the goose in their effect upon the coagulation of goose-blood. The methods used in these two cases were not identical, as stated above. The specificity which has now been established does not exclude the possibility that the coagulin of one species may not also act, though less strongly, upon the blood of another species. In addition, substances exist which have a non-specific influence upon the coagulation of the blood of different species of animals, as, for instance, Witte's pepton and leech extract. Such non-specific substances exist also in the tissues of other animals, as, for instance, in the crab and, perhaps, in certain vertebrate tissues.

The coagulins therefore are analogous to certain substances which are obtained through the process of immunization, namely, the agglutinins, precipitins, and lysins. They also resemble these substances in being decidedly useful to the animal in which they are found.

Each species of animal so far tested has specifically adapted means for preventing a dangerous loss of blood. The origin of this mechanism is a problem of great interest. Even granted that those animals of each species which did not possess specific coagulins were destroyed in the struggle for existence, such a selective process does not explain the origin of these useful specific substances. We would not be satisfied if the attempt were made to cut short our investigations into the origin of the specific products of artificial immunization by the hypothesis that they were due to selective changes which took place during the processes of evolution. In the case of artificial immunization we study experimentally the changes which take place when an animal is immunized. In the case of the coagulins, we have to deal with specific substances existing naturally and not created by artificial immunization. A comparison of the specific relations existing between the fibrinogen and the tissue coagulins of each species of animals, and of the specific relations existing between a substance introduced experimentally into an animal and the new substance arising in the body of the animal suggests that also in the case of the coagulins the specificity has been acquired through a process of auto-immunization. We would have to assume that the presence of a certain fibrinogen produces a specific tissue coagulin or vice versa.

Another aspect of the specific relation between the fibrinogens and the tissue coagulins may be briefly mentioned. We have here to deal with another instance of an interdependence between apparently not connected organs and tissues—as it is for example, known to exist in the case of the thyroid and the ovaries in their relations with other tissues, or as it is also known for enterokinase and trypsin.

Is the effect of different tissues upon the coagulation of the blood due to the lymph circulating in the organs? Is the lymph the only carrier of the specific substances acting upon the blood?

The following cosiderations make it improbable that the lymph is the carrier of this specific substance. A careful washing out of a piece of tissue does not materially diminish the influence of

the tissue upon the coagulation of the blood. Further, the lymph obtained from the thoracic duct of the dog has approximately the same power as a blood-clot of the dog to induce the coagulation of the blood plasma of the goose. On the other hand, the muscle of a bird, even if it has been previously washed out, has an equal or usually even a greater power of causing the coagulation of the blood plasma of the goose than either the goose or dog clot.

Finally, it can be definitely proven that the influence a piece of muscle of a lobster has upon the coagulation of the blood-plasma of the lobster is caused by a substance derived from the muscle itself and not from the circulating body fluid.

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## PUSTULATION AND ITS ACCOMPANYING SECONDARY FEVER A COMPLICATION AND NOT AN ESSENTIAL SYMPTOM OF SMALLPOX.

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Smallpox:—"An acute infectious disease, characterized by an eruption, which passes through the stages of papule, vesicle, pustule and crust. The mucous membranes in contact with the air may be affected. Severe cases may be complicated with cutaneous and visceral hemorrhages." According to this definition, which is the one generally sanctioned, the pustular stage with its attending secondary fever is considered as an essential feature, and is not regarded, as I regard it, as a complication due to the infection of the essential lesion of the disease by pus organisms present in the skin. These are present more or less at all times and only require some morbid condition to excite them to action, one, which provides a suitable soil for their development and display of their pathogenic characteristics. They are lurking foes, vultures, which ever hover around the battlefield. Their number is legion or few according to the cleanliness and healthiness of the skin; an uncleanly skin is always an unhealthy skin, for it, like any other organ, rebels against any factor which interferes with its functions, and dirt will do this, producing a lowered vitality of the tissues.

Smallpox, in common with other zymotic or germ diseases, is caused by a micro-organism gaining access to the body, either by inhalation through the respiratory organs or through the skin; from its characteristic cutaneous lesions, one is led to believe that the latter is principally the organ of entrance. On account of the supposed germicidal properties of the red-blood corpuscles, it is not likely that it is by the circulation. It is doubtful if organisms ever gain access to the tissues by this agency. This particular organism has not as yet been isolated, a fact which appears rather strange, but which is in all probability due to search for it not being instituted at the proper time, which is when it is at the height of its activity and before nature has attacked it, *viz.*, in the initial stages, when it may be found in the shotty papules, as yet unattended by an inflammatory reaction. These are the camping-grounds of the detachments of the enemy. Having gained access to the body by some channel they develop in the cutaneous tissue and mucous membrane near the surface, rarely and in only very severe cases are the more internal mucous membranes the seat of lesions caused by the germs themselves being present; cases in which nature and art being unable to cope with the foe, it has invaded other territory than that which it first planned to attack. The visceral lesions usually observed are due to toxin irritation and not to the presence of the germ itself; these toxins being carried by the blood and lymphatic vessels. The period of incubation varies from seven days at the earliest—I know of one case in which the disease manifested itself six days after exposure, the patient being on in years—to fourteen or more at the latest. Like all other organisms, vegetable or animal, it lives its little life, is begotten, takes in nourishment, elaborates it for its own use, excretes waste products, grows and begets its kind. During this period of incubation the number of organisms rapidly increases and with the increase in number there is consequently an increase in the amount of microbic excretion in the human body or host of the parasite, for such it is, as it deprives the cells of the tissue it has invaded of their lawful amount of nutriment, thus rendering them more vulnerable later on to its poisonous action. It is like the enemy that plunders the inhabitants of a district before the avenging force comes up. When such an amount has accumulated that its irritant effects are felt by the host—the harassed party has reported at headquarters and the governing body undertakes to protect them—his channels of elimination not being adequate for the draining off or removal of this matter—toxins—it poisons his system, the finer and more delicate structures feeling the effects first: the host rebels and constitutional symptoms, the first evidence of the presence of the organisms are manifested; this is the stage of invasion. In this particular disease the initial symptoms are severe frontal headache, lumbar pain, sometimes scarlatiniform or measly rashes corresponding to the areas supplied by the irritated lumbar nerves in particular; vomiting, chills and elevation of temperature. The toxins circulating in the fluids of the body in sufficient amount at last irritate the nervous system and through the sympathetic institute an inflammatory reaction. Nature ever seeks to thwart the effects of any foreign substance, animate or inanimate, by this method, in all disease the angioneurotic factor is present. The more delicate tissues are the first to suffer. It is not necessary that the micro-organisms themselves shall be present in these tissues, their toxins alone will be sufficient.

The symptoms of the stage of invasion are a warning to nature that an enemy is at work and that immediate action on her part at the camping-ground of the foe is required and this is exactly

whither she directs her forces; she sets up a severe acute inflammatory reaction around the shotty papules, for herein lies the foe. These initial symptoms are all evidences of the poisoning of the finer tissues, disturbance of the nerve centers and nervous tissue. On the third or fourth day of the disease red papules appear first on portions of the body where the skin has been more exposed to irritation and less vascular portions, and parts exposed to air especially on the forehead and at the wrists; these are also situations in which one variety of epidermis is merging into another, the more delicate cuticle of the face to that of the scalp; that of the forearm to the denser of the hand. Points of cleavage are always weak points. The lesser vascularity of such parts renders inflammatory reactions less formidable to the enemy and thus allows him more time in which to produce his poisonous weapons—toxins. Later the eruption spreads over the face and extremities and finally appears on the trunk.

That the source of entrance of the micro-organism to the body is mainly, if not altogether, by the skin, is likely for it is the exposed portions of it that are first attacked, involvement of other portions occurring later probably from auto-infection. The severity of the disease is always proportionate to the number of lesions on the face. "If upon the face they are as thick as sand it is no advantage to have them few and far between on the rest of the body." While this statement serves to show that great face involvement denotes great severity of the case, still it must lessen the danger to have only a few on the body, for each lesion represents a collection of the foe; but if from great face involvement we naturally expect also great trunk involvement, and it does not occur the view may be taken that the foci are situated in the latter position; but that Nature is unable to attack so great a force and these foci on the trunk escaping inflammatory reaction still continue to pour forth toxins into the body, remaining shotty papules instead of becoming red inflammatory papules; inflammatory reaction having the effect of preventing this continuance of the elaboration of toxins by destroying the micro-organisms as will be explained later on.

The red papule consists in the center, of the germs which formed the shotty papule, surrounded by the products of inflammatory reaction (liquor sanguinis and leucocytes), the vessels surrounding the papule being in the state in which they are found in inflammation of a tissue. This is Nature's method of attacking the foe, she surrounds him and hems him in and sends her warriors, the leucocytes, to destroy him and also another factor, the liquor sanguinis. Each papule is a small well-defined battlefield; the center of it is occupied by the foe, which multiplies indefinitely and elaborates toxins in increasing amounts; the circumference contains the factors of Nature arrayed to cut down the enemy. Nature in her attempt to destroy the pathogenic factor does not in some distant organ of the body produce some substance inimical to its existence; but she at once, through her angioneurotic, her nervous circulatory combination surrounds him by an area of inflammation and hems him in. All the different phases of an inflammatory reaction are gone through; dilatation of vessels, acceleration of blood stream, followed later by retardation and finally stasis; with escape of fluid and corpuscles—the red only in the most severe reactions. The vessels contain an increased number of white-blood cells for a leucocytosis has occurred to enable Nature to successfully attack the enemy and the blood-making organs have been called upon to increase their output of white corpuscles—enlargement of the spleen is often noticed as also glandular enlargement.

The first portion of the liquor sanguinis which passes from the vessels into the tissue surrounding each clump of organisms—shotty papule—is absorbed along with the toxic matter from the organisms, as lymphatic circulation is not as yet impeded; but a little later on the leucocytes in ever increasing numbers escape also from the dilated vessels into the tissue; those in the front ranks fall victims to the toxins of the micro-organisms, but others from the rear take their places. The dead bodies of the first have a function to perform (for dead as well as living they are useful); by their death their contained fibrin ferment is set free, this acts on the fibrin-forming factors contained in the liquor sanguinis and fibrin is formed, which entangles in its meshes the pathogenic organisms along with some of the blood cells—the fly is now caught in the spider's web and the enemy is entrapped and slain, for, bathed in its own toxic matter it now poisons itself.

Every animal has within its own self the means of destroying itself, retained excrementitious matter means auto-intoxication and in this case, it also retains its toxins and lies entangled in a clot containing them. It is a Black Hole of Calcutta. This clot is the area of coagulation necrosis noticed on the section of a papule. It is creamy white or greenish yellow in color from not containing colored corpuscles. During this inflammatory reaction many leucocytes are forced into the deeper layers of the skin, the papillæ of the cutis vera, from which they later on pass outward and taking on the characteristics of the cells of the cuticle repair the destroyed skin; for the organisms in the heyday of their power caused the death of many cells by depriving them of their normal amount of nutriment and also by their toxic action on them. The destruction so far in the disease is not so marked as what may result from the effects of the secondary infection by pus organisms. Nature having performed the great master-stroke in slaying the micro-organisms, now that they are dead in her hands gradually lessens the reactive inflammatory action and the escape of leucocytes and fluid is restricted. What fluid does escape is prevented from being carried off at first by the lymphatics by pressure from the exudate on these vessels; this fluid no longer be-

ing necessary for the formation of a clot collects in the intercellular spaces of the tissue forming the outer zone of the papule; the coagulum contracts and the serum being squeezed out of this by the contraction, also increases the amount of clear fluid and thus form the vesicle—the vesicular stage. The coagulated area in the center of the papule prevents the fluid from distending it in the center, hence the umbilicated or depressed vesicle, for the fluid is forced to expand the periphery alone. If fluid were injected into the tissues surrounding the abdominal umbilicus it would distend the former but not the cicatrix: this is on the same principle—for what is a scar but organized fibrin?

With the appearance of the characteristic eruption in its first phase, red papules, the temperature falls and the patient becomes comfortable from a cessation of the other initial symptoms also, and if no complication, such as pustulation, arose the duration of the disease would be short. The irritation from toxins being removed (for with the destruction of the organisms this source of irritation has been removed), the circulation resumes its normal state; pressure from inflammatory reaction being removed the lymphatics again assume their function and the serum in the vesicles is absorbed. "Cases in which hemorrhage occurs into the vesicles at once dry up," showing that depletion of the inflammatory area hastens absorption of fluid by renewal of pressure.

In chickenpox the vesicle is not umbilicated, because in this case, due to the lesser virulence of the toxins, the circulatory disturbance is less—fewer leucocytes escape and a coagulum is not formed in the center of the papule.

Unfortunately, instead of vesiculation being the final cutaneous lesion in smallpox there is a subsequent one,—pustulation, this being, in my opinion, the result of a secondary infection by pus organisms, which are ever present in the skin. Most probably those present at the time of the entrance of the smallpox organism would perish from the toxins excreted by the latter, for if they did not we should have evidence of pustulation earlier than we do; but on the cessation of the excretion of the toxins of the smallpox germs by the death of the latter, these pyogenic organisms will find the vesicular fluid a suitable medium in which to flourish; it is not a highly toxic fluid because the toxins have been taken up by the organisms themselves and lie inert in their dead bodies, toxalbumins. This vesicular serum soon becomes turbid from the rapid development of these pus germs and the vesicle becomes a pustule, the coagulated area is broken down and the pustule assumes a globular shape, thus differing from the umbilicated vesicle. From the toxins excreted by these organisms and probably from the liberation of toxic matter from the decomposed coagulum a secondary systemic irritation results with a rise of temperature and a second inflammatory reaction around the foci of infection. These later foes must be dealt with in the same manner as the first. The temperature again falls when the foe is overcome and convalescence is now entered upon. It was stated before that when hemorrhage occurs into the vesicles, they dry up and the disease is aborted. This is due no doubt to the germicidal action of the red cells of the blood on the pyogenic organisms in the vesicular serum. The extent of scarring or pitting depends on the extent of the pyogenic mischief; if it is extensive the leucocytes stored up in the papillæ of the skin for reconstructive purposes are destroyed and new cells are not forthcoming to replace the old which have perished.

It is said by the highest authorities that the disease is infectious throughout its whole course, that the contagium exists in the secretions and excretions and in the exhalations from the lungs and skin, the dried scales of the latter constituting by far the most important element. There is a doubt in some minds as to whether the disease is infectious before the eruption develops and in the mind of the laity it is supposed not to be contagious until the stage of pustulation and scabbing is reached. I believe that the disease is infectious in its earliest stages, when the germs are developing in the skin—shotty stage—and throughout the course of the disease. Germs work their way from the camping-ground into surrounding tissue and pass to the surface as the lesions are situated in the skin and mucous membranes near the surface, here they are given off in excretions and secretions passing from these parts and are also thrown off in the scales of epidermis and epithelium which are normally shed; this shedding at the termination of the disease will be more abundant but it is, however, going on all the time. The germs contained in these may not be in an active state, but once taken into a new host they quickly take on active properties and cause the disease. In an epidemic at present prevalent those exposed presented the symptoms just fourteen days after; they must have taken in the germs while the first patient was in the earliest stages of the disease for he was at once removed.

I do not consider the well-developed red papule, vesicle and pustule particularly infectious, but rather the surrounding skin which contains dormant germs; for in the other cases the germs have been attacked by Nature. The epidermis being a non-vascular structure deriving its supply of nutriment from the vessels of the underlying cutis vera, will not be engaged in the active inflammatory reaction. It suffers from its supply of nutriment being curtailed on account of circulatory disturbance and is more abundantly and rapidly shed with its dormant micro-organisms. The pustules are contagious by reason of their pyogenic cocci, not from their smallpox germs, unless a few may have survived.

The cure of germ disease depends on the destruction of the organisms by their own excretions; this is Nature's method and if unaided she cannot accomplish it, art must be called in to assist her; but to be successful it must be by a means analogous to Nature's plan. In serum

therapy we have this. The nearer we approach to the understanding of her methods, the simpler will be our treatment and the less empiric drugging will there be. If, in smallpox for example, organisms enter a host; the skin being the point of attack, they multiply, but there is as yet no inconvenience suffered by the surrounding tissues, save that the germs deprive the cells of their normal amount of nutriment and thus render them, later, more vulnerable. While at first, on account of their as yet small numbers the micro-organisms have not excreted more toxic matter than can be drained from the system by the organs of elimination, the host has not suffered: but if his organs are at the time in a dilapidated condition elimination will not be so thoroughly carried out and systemic poisoning will be the sooner established with its initial symptoms and succeeding inflammatory reaction: but if they are acting normally the stage of systemic invasion will be later in appearing. At last, due to the rapid increase of germs and, therefore, the enormous increase of toxic matter, even these so far healthy organs cannot adequately remove it and systemic poisoning occurs.

Since the introduction of the so-called antitoxin treatment of diphtheria much has been written concerning a substance being formed in the body during disease, which neutralizes the effects of the toxins and renders them harmless. This has led bio-chemists far afield and has opened up glorious fields for research: but is this the case? I do not believe that the so-called antidotal substances are formed. All animals excrete substances which if they are retained within the body, or if re-admitted will cause their own death; but no antitoxic substance is formed to neutralize them. Why, then, in the case of disease from the toxins of micro-organisms? Such a theory will not stand the test of future research. The serum injected in diphtheria is the serum of the blood containing the toxins of the diphtheria micro-organism. By its injection Nature is anticipated and a systemic poisoning is hastened, whereby the inflammatory reaction is brought into play and the organisms so much earlier attacked. Constitutional symptoms are accelerated and intensified but the cure is brought about so much earlier than if Nature is unaided. This is the curative effect of the injection of a toxin serum. There is also the protective effect: one attack usually confers immunity to this disease on the person for some time, if not for life, and so does the introduction of the serum prevent the exposed from contracting the disease; here the enemy on gaining access to the body is at once dealt with: Nature is prepared for him. It is much better to deal a decisive blow at the foe early in the disease, for then the system is in a better condition to react: the toxæmia from increased waste products and the semi-starvation have not as yet been felt by the body; prolonged action weakens the resisting forces. In many diseases, as yet, instead of serum treatment being used germicidal drugs are had recourse to: aiming at destruction of the foe with carbolic acid, mercury and others, and, as I have shown in an article on the "Action of Ferric Chloride in Erysipelas and Allied Conditions," in the *Medical Record*, aim at hemming in a foci of infection, thus imitating Nature's method. The treatment of smallpox and all other germ-caused diseases should be by means of toxin serums. It may be asked why introduce a substance similar to that which is causing such severe constitutional symptoms; but in this lies the cure, severe constitutional symptoms evidence on the part of Nature the ability to react. Cases of smallpox with most marked initial symptoms are usually the ones of shortest duration and less severe future course. Ambulatory attacks of typhoid fever are often fatal.

*Vaccination.*—The inoculating of man with the virus of an eruptive disease of the cow; a local pock with constitutional disturbances is produced and protection from smallpox, more or less permanent, is obtained.

Cowpox, if not the same disease in the cow as smallpox in man, is very similar. In the cow it goes through the same initial symptoms; papular, vesicular, pustular and scabbing stages. It is during the vesicular stage that the vaccine is removed for vaccination purposes. Now, what is present in an umbilicated vesicle at this time? An area of coagulation necrosis—clot—and serum containing pus organisms, which have entered from the surrounding unaffected skin and are rapidly multiplying; the area of coagulation necrosis contains fibrin; broken down leucocytes, free toxin; toxalbumins formed by the action of the toxins on the germs and some germs, which may have not been destroyed and are lying quiescent, ready on removal to set up a new infection. In vaccination, what do we use, the serum of the vesicle which is multiplying pyogenic organisms or the clot or pulp? The best firms who prepare vaccine tell us that they prepare it from the pulp. If this is so we are inoculating the person with the free toxins, undestroyed cowpox micro-organisms and toxalbumins from which the toxic element may be liberated. In this aseptically prepared vaccine constitutional symptoms and local pock do not appear until seven or eight days after inoculation, but in the varieties of vaccine which contain both the serum of the vesicle and pulp—the older kinds—constitutional symptoms and the local pock appear as early as the second or third day and the disturbance is more marked. No doubt the presence of pyogenic cocci in the serum is responsible for this; pyogenic organisms have a short incubation stage and, already having multiplied in the serum, they are fitted for action, the first constitutional disturbance is no doubt due to them and this is quickly followed up by that of the cowpox germs. In vaccination as well as in smallpox the stage of pustulation is a complication. In the aseptically prepared vaccine carefully inoculated into a clean scarified area with the skin surrounding it kept clean pustulation should not occur. What are we doing by this vaccination process? Merely from a small laboratory in the human body elaborating sufficient toxin to

render the person vaccinated immune to smallpox. Immunity depends on the presence in the body of an agent harmful to the germ causing the disease. The same effect is produced by injecting as a safeguard against other diseases, serums obtained from animals susceptible to such diseases and injecting these serums, which contain toxins into the human body; cholera, typhoid, diphtheria, and so on; why not do the same in smallpox? Jenner's great discovery has been a boon of untold good to humanity; but with all due regard to the great discoverer, it is only a half method and in this day of toxin serumtherapy it ought to be relegated to its proper place of what has been best, but which is not now best. With the introduction of a toxic serum as a protective agent many complicatory symptoms and disturbances would be done away with and in the case of exposure to the disease the protective action would be more rapid. It certainly is the protective and curative treatment of the future. This serum would have to be taken from the cow, as the diphtheria toxic serum is taken from the horse. The period of invasion or initial symptoms would be the time, when the blood is saturated with toxins, veins in the vicinity of the part affected the udder, would probably yield the greatest amount. The author will feel grateful to any one, who will take up the subject, where she has been compelled for the present to stop, and who will carry it through.

Do the toxins of other diseases than the one in question exert an immunizing effect on the person who has been the subject of their ravages? I fancy so, although the protection may not be so lasting. In an epidemic of smallpox, which occurred in the Toronto General Hospital patients suffering from typhoid fever showed marked immunity, some years ago under an incorrect diagnosis, a case was admitted to our own hospital; there was only one other patient in the ward at the time, he was suffering from purpura hemorrhagica and could not be vaccinated; but although exposed for some time to smallpox, he escaped infection. Later on, some weeks in fact, he carried the infection to all the people he visited. In a slight epidemic, from which we are now emerging, all the members of one family save the father and a girl of eight or nine years of age have been attacked. This child had an attack of scarlatina followed by severe inflammatory rheumatism eight months previous. By Dr. Graw, of Buffalo, it was observed that vaccination lessened the severity of an attack of influenza.

*Treatment.*—In conclusion, a word as to the treatment of smallpox, and the prevention of pustulation will not be out of place: (1) Injection of a toxic serum obtained from a cow suffering from the initial symptoms of cowpox. This toxin serum should be injected in the stage of invasion, as soon as symptoms have been observed; (2) cleanliness and disinfection of the skin, to prevent an accumulation of pyogenic organisms and the internal administration of calcium sulphide to prevent pustulation, as in furunculosis; (3) opening of all vesicles, thereby removing the vesicular fluid, which is such a medium for the growth of the pyogenic organisms and the painting of each opened vesicle with aseptic collodion. The prevention of pustulation will abolish pitting, for in the early stages of the disease the cutaneous involvement does not extend into the cutis vera; (4) treat symptoms as they arise.

Smallpox is an acute infectious disease, caused by a special micro-organism not yet isolated, passing through a stage of incubation during which there are no symptoms, followed by a stage of invasion with initial symptoms in which the shotty papules may be detected, followed by the red papular and vesicular stages.

## MEDICAL PROGRESS.

### MEDICINE.

**Antistreptococcus Serum.**—The present status of this subject has been thoroughly investigated both clinically and experimentally by Menzer (Münch. med. Woch., June 30, 1903). Over 100 cases were under observation and the author's main point was to determine the indications and contra-indications for the use of the serum. The value of this remedy has lately been largely overrated and a warning is extended against its indiscriminate employment. The serum as shown by animal experimentation, is effective by stimulating phagocytosis, and the organism itself therefore assumes an important rôle in the fight against the streptococci. When this function is no longer possible, the administration of the serum is of no value. In addition to the destruction of the pathogenic organisms, the body is also compelled to get rid of the dead bacteria and the cells. In those cases where there are walled off collections of pus, the use of the serum is contra-indicated, unless surgical interference is also practised, as the serum increases the resorption of the toxic purulent products. The serum gives the best results in acute cases, if given in large doses. In chronic mixed infections it should only be given if the condition of the patient, and particularly the lungs, make it probable that the organism is still able to attack the chronically inflamed foci of inflammation. The serum should be given in small and gradually increasing doses. Only those sera are effective which are freshly prepared from streptococci of human origin. Standardizing the serum by animal experimentation has thus far afforded no means of judging the degree of curative power in the human subject, and for the present the effect on the individual is the only measure of its action.

**A New Method of Hemo-Alkalimetry.**—Most of the methods for the purpose of determining the concentration of alkali in the blood depend on the reaction with some chemical indicator and require for their application a volume of blood only procurable by the scalpel or the cupping glass. The results in such cases are only approximate and do not determine delicate variations. A new method for determining the neutralization of the blood at an exact and definite point, which is free from the inaccuracies of test papers and does not react solely to certain of the complex ingredients of the plasma, but shows the point of neutralization of the whole blood, is presented by Arthur Dare (Bull. Johns Hopkins Hosp., July, 1903). Blood, when examined with the spectroscope, gives the characteristic spectrum of oxyhemoglobin, unless changed by the absorption of certain gases or the introduction of sub-

stances that modify the composition or functional conditions of the plasma. As the blood is diluted and examined in a stratum of a certain thickness, the absorption bands of oxyhemoglobin are observed to fade away, but are made to reappear when this stratum thickness is increased. When, however, blood is triturated with an acid reagent, the spectrum of oxyhemoglobin disappears and cannot be restored by the addition of an alkali or by increasing the stratum to the maximum, which is capable of illumination for examination spectroscopically, hence the spectrum of oxyhemoglobin may be removed by dilution or by neutralization, in the latter case the hemoglobin is changed and its characteristic spectrum is destroyed permanently, while in the former it can be made to reappear by increasing the concentration of the hemoglobin. The new method is based on this observation. The basic material is neutralized by a solution of tartaric acid, gm. .075, to distilled water, c.c. .200. The special instrument devised by the author for this test consists of a capillary blood-tube and a reagent pipette. The latter contains the acid reagent. The lower end of the blood-tube is then examined with the spectroscope, and if the bands of oxyhemoglobin are present, the acid is added carefully drop by drop, and when the bands suddenly disappear, the observation is at an end. It is then only necessary to read the result from the scale on the test tube, which is graduated in cubic centimeters and the equivalents expressed in milligrams of sodium hydrate to 100 c.c. of blood. The author has devised a special scale of equivalents, in mgs. of sodium hydrate to 100 c.c. of blood. There is a more or less constant relation of the alkalinity of the blood to the color index, and the author has attempted to make this the basis of comparison. For this purpose some 75 cases were examined. In enteric fever a marked decrease in alkalinity is the rule. This is also true in tuberculous disease with glandular involvements, while with tuberculous meningitis or peritonitis the alkalinity shows an increase or falls late in the course of the disease. In gastric ulcer there is a fall in the alkalinity below the color index, while gastric cancer shows an alkalinity above the color index. The anemias all exhibited a decided fall in alkalinity, while observations in chlorotic subjects showed the alkalinity to follow closely the normal color index. The administration of excessive amounts of sodium bicarbonate had no effects on the hemoglobin tests. In splenomedullary leucemia the alkalinity suffers a marked decrease, while in splenic anemia and cholemia it shows a rise. Catarrhal jaundice and amyloid liver both raise the alkalinity of the blood; cholelithiasis presents an evident decrease. Croupous pneumonia, phthisis, influenza, acute appendicitis, even in the presence of a frank leucocytosis, showed an increased alkalinity, while investigations upon malarious subjects appear contradictory. The relation that the alkalinity bears to the excretion of urea still needs investigation. These studies tend to show that in those diseases which present a marked decrease in the alkalinity, they at the same time exhibit a marked increase in the quantity of urea eliminated.

**Obliteration of the Superior Vena Cava.**—While signs of compression of the superior vena cava are not very uncommon in cases of aneurism of the aorta and in mediastinal tumors, instances of complete obliteration of the vessel, with the establishment of a collateral circulation, are extremely rare. W. Osler (Bull. Johns Hopkins Hosp., July, 1903), reports one case under his observation for three years, long enough to make a diagnosis of fibroid obliteration by exclusion, and a second in which the obliteration was due to compression in Hodgkin's disease. Of the 29 cases reported in the literature, thrombosis due to disease within the vein was found in 10. The others were due to lesions outside the vein—tuberculosis, mediastinitis, aneurism, syphilis, periaortitis, carcinoma and fibroma. The symptoms of the condition depend entirely upon the degree to which compensatory circulation has been established. Obliteration of any one of the three great veins of the body may exist for many years with even good health and a completely effected collateral circulation. The clinical summary of the first patient, a young negro, was as follows: Hard work, alcohol and exposure; dyspnea, swelling of the neck and face; gradual distention of the superficial thoracic and epigastric veins; improvement for a time; gradual increase in the size of the superficial veins; the finding of tubercle bacilli; finally, fever, delirium and unconsciousness. The autopsy showed a tuberculous caries of the spine, fibrous mediastinitis with obliteration of the superior vena cava and innominate veins, and a tuberculous meningitis. In the second case there was present a Hodgkin's disease, with compression of the superior vena cava and the formation of an extensive collateral circulation. The disease ran an unusually chronic course and was also marked by the extreme distention of the superficial veins of the thorax and abdomen. There were occasional periods of improvement from the administration of Fowler's solution. At autopsy it was found that the superior cava was completely obliterated by the enlarged mediastinal glands.

**Malarial Cough.**—Attention is again called to the occurrence of cough of malarial origin, by V. Piazza-Martini (Gazz. Siciliana di Med. e Chir., June 4, 1903), who describes three cases which came under his observation in which there was a persistent cough, resisting all ordinary remedies and coming on in paroxysms at about the same hour each evening. In none of these cases was there a malarial history; but the periodicity of the paroxysms, presence of enlarged spleen in two of the patients and absence of other cause, suggested the possibility of malaria in the etiology of the affection. That this diagnosis was correct seems to be proven by the prompt subsidence of the cough after a few days' administration of quinine. The author quotes Sverjvsky's article on malarial cough in which he states that it has all the characteristics of nervous cough and that it may precede or follow the febrile phase of malaria or constitute the sole evidence of malarial cachexia. The latter writer holds that the respiratory condition is not produced by the local action of the malarial toxins upon the mucous membrane, but rather by the effect of the disease upon the general nervous system and especially the sympathetic.

## SURGERY.

**Two Fatal Cases of Partial Thyroidectomy.**—In Egypt goiter is a very common condition, and the operation of hemisection is very frequently done. Frank C. Madden reports (Lancet, June 20, 1903) from the Kasr-El-Aini Hospital, Cairo, two deaths which arose apparently from diametrically opposite conditions. In one, a girl of twelve years, the goiter was tri-lobed. No trouble was experienced in shelling it out but a mass near the isthmus, the size of a walnut, was left. Two days later she had a severe attack of dyspnea from laryngeal spasm. Twelve hours later the hands and feet showed marked signs of tetany and gr. v. of thyroid were given twice a day. This was continued a week, and when all symptoms of tetany had disappeared maltine was substituted for it. Two days later the tetany reappeared and was not checked by renewed administration of thyroid. Finally, twenty-four days after operation she died of tetany of the respiratory muscles. The second case was an antithesis of the first in that death resulted from hyper- rather than hypo-

thyroidization. The wound was packed tightly, but as the patient showed marked restlessness immediately on coming out of the anesthetic, this was removed and the part irrigated with salt solution. Pulse was at this time 144, respirations 52 and temperature 102° F. He was infused with hot salt solution, 1½ litres, all to no purpose. He died twenty-eight hours after operation. It seems to the author probable that, had he pushed the thyroid in the first case he would have saved the first case, but it is interesting to note that the tetany was not controlled by thyroid when it was exhibited the second time.

**Tetanus Prophylaxis.**—The value of tetanus antitoxin as a prophylactic is shown in a series of observations made by J. McFarland (Jour. Am. Med. Ass'n, July 4, 1903) in some 800 horses used for immunizing experiments, in manufacturing different sera, and which were constantly being injected and bled at frequent intervals, and occasionally suffered from local lesions consequent upon the irritative actions of the injected toxins. During this period of four years there was a death-rate from tetanus in spite of all precautions, which at times reached 10 per cent. A systematic immunization was then begun with antitetanic serum, 10 to 25 c.c. of a low grade being injected every three months. The death-rate rapidly decreased and in the second year was reduced to less than one per cent. The practical conclusions to be drawn from these observations may also be applied to the human subject, and the author believes that in all suspicious wounds, which are likely to be followed by tetanus, the antitoxin should be given as a prophylactic measure. The only objections are the cost, poor keeping qualities of the serum, and the method of administration by subcutaneous injection. The latter may be obviated by dusting dry serum on the wound surface, as already advocated by a French observer. Experiments made on guinea pigs by the author, demonstrated that the dried serum fully protected inoculated animals. The advantages of the latter method are that the dry serum preserves its activity indefinitely, requires no instrumental administration, but can be sprinkled from the bottle in which it is dispensed directly on the cleansed wound. It is non-irritating, and neutralizes the toxin in the wound and, being absorbed, also neutralizes the toxin which has been taken up by the patient's blood. The more universal use of the dried serum is strongly urged in all suspicious cases.

**Treatment of Anthrax with Intravenous Injections of Collargolum.**—The introduction into the system of derivatives from metallic silver is attracting very great attention. Dr. Roman Von Baracz (Archiv f. klin. Chir., Vol. 70, No. 2, June, 1903) details the interesting history of three cases of anthrax, which to all appearance were very greatly benefited by this new drug. Large doses, viz., up to cm. xxx were used, since the author had found it to be harmless to dogs even in doses proportionately greater. One thing of some import, to be gathered from his report, is that a severe chill invariably followed the injections, but that this was the exception, if the very newest form of the drug was used. The local treatment of the pustule consisted simply in the application of wet aluminum acetate, so that no one could assume the recovery of the patient and rapid sloughing of the pustule to be due to anything but the collargolum. The author has used this form of treatment in typhoid fever with very good results.

## OBSTETRICS AND GYNECOLOGY.

**Why Minor Gynecological Operations Fail of Effect.**—We may accept as an established axiom that the majority of genital ailments are due either to trauma during accouchement, or specific infection, and that the ultimate results of such accident or infection, *i.e.*, diseases of the uterine adnexa, are not to be relieved by surgical or medical treatment of the original lesion says S. Goldberg (Buffalo Med. Jour., July, 1903). For example: Given an injury of the cervix during labor, which is not repaired at the time of injury or in six months or a year following, an endometritis due to eversion of the contiguous mucous membrane naturally follows, and as there is no structural barrier to limit the process, adnexal involvement ensues. Next, from the constant irritation and increased weight of the uterus, retroversion or flexion occur; these being in the author's opinion the most frequent complications of adnexial disease. In his belief, it is the height of folly to repair the cervix and fasten the uterus by the Alexander method or any modification of it, as it is morally certain that after a year the seeds of disease are sown in the tubes and ovaries and the symptoms, such as pain, metrorrhagia, sacralgia and more or less permanent invalidism are really due to adnexial involvement. Therefore, it is the part of wisdom and safety to open the abdomen, examine the adnexa and treat them radically or conservatively; as in the majority of cases the most of the trouble will be found there. He limits the Alexander operation to acute retroversion of recent standing and holds that all so-called minor gynecological operations, to be of any permanent benefit, must be performed within one year from the time of infliction of the original lesion, and that after a year, Alexander's operation, trachelorrhaphy or curettage or all combined, will be insufficient to restore the patient to health; for the reason that in the majority of cases the adnexa are involved by that time.

**Objections to Vaginal Route in the Treatment of Ectopic Gestation.**—The treatment of this condition has gone through an evolution from a stage of inaction to one of prompt surgical action, passing an immediate one of electrical application. At the present time, J. W. Bovée (Amer. Jour. of Obstet., June, 1903) believes that no physician would fail to recommend surgical treatment, once the diagnosis is made. Failure of diagnosis is due to faulty, early teaching. Symptoms of slight rupture of a pregnant tube may occur particularly in the early stages, at a time when menstruation is expected, or even earlier. The same is true of tubal abortion. In both conditions there may be no evidence of shock, but when it does occur it is typical. Pain and collapse are usually less than are said to be present. Any inflammatory condition of the pelvic peritoneum, tubes or ovaries, may give as much pain, and because of its slight degree, these cases are often mistaken for uterine abortion. Severe internal hemorrhage is not so liable in early rupture as abortion of a pregnant tube in the early stages, as it is then more apt to be slow and may be but slight. The expulsion of a decidua at this time may be overlooked. The author's reasons for preferring the abdominal route in operating on these cases are: (1) The field of hemorrhage can be more quickly reached, taking into consideration the relative amount of time consumed in cleansing the two routes under anesthesia. (2) The condition can be more readily treated and the ligation of blood vessels more readily and certainly performed. (3) The danger from secondary hemorrhage in ectopic pregnancy is markedly less when the blood vessels are ligated than when the removal of the clots alone is practised. (4) Any other important pathological lesion requiring attention may, in suitable cases, be attended to in the same sitting. The shock, as a rule, will be less than when the vaginal and abdominal incisions are both made. (6) The tube can be more readily removed than by the vaginal route. (7) The abdominal route is applicable to all stages of

pregnancy which is not true for the vaginal route in the latter months. (8) The vaginal incision has no place in the treatment of an unruptured pregnancy, while the abdominal incision is the route par excellence.

**Better Care of Women after Labor.**—During the lying-in period, if one is fortunate enough to escape infection, the much stretched, contused and lacerated parturient tract is, says Wm. M. Sprigge (Am. Jour. of Obstet., June, 1903), given no further attention. Somewhere between the seventh and twelfth days, if the patient complains of no special discomfort, she is allowed to get up. The getting-up period is not, as a rule, determined by a careful examination of the pelvic organs, but is dependent upon the absence of subjective symptoms, the progress of involution having never been accurately determined. It is difficult to understand why one part of the parturient tract should be repaired and other lacerations left to shift for themselves, yet much of the practice of to-day is along this line. Nor is it necessary to repair these lacerations within twenty-four hours after labor; some of the lacerations cannot be best repaired at this time, but after twenty-four or forty-eight hours when the edema in the parts has subsided, they can all be repaired and made to heal by primary union. Any lacerations in which large blood-vessels have been torn should be repaired at once. The primary union of the perineum will take place if it be repaired some time after labor. Many of the vaginal lacerations are submucous and cannot be so well detected immediately after labor; these, if neglected, often result in the most severe cases of cystocele and rectocele. They are not hard to repair. The writer agrees with Hirst that it is best to repair the cervix forty-eight hours after labor, and that every woman should be subjected to three examinations after labor, viz.: The first within forty-eight hours to detect the injuries of childbirth. The second, before she leaves her room, to determine the position of the uterus. The third at the end of the puerperium, six weeks after labor, to observe the condition of all the pelvic organs and structures of the abdominal wall, the coccyx, and the position of the kidneys. The author has made it a practice to examine the patient for the second time before she leaves her bed. There is less danger, it would seem, of pelvic inflammation, of puerperal infection by consistently repairing all lacerations of the cervix and vaginal tract, when done by surgically clean hands, than by leaving these conditions to take care of themselves, especially as parturient women are even more liable to infection through vaginal lacerations than by way of the endometrium.

## GENITO-URINARY AND SKIN DISEASES.

**Localized Ichthyosis.**—The patient was a soldier, twenty-one years of age, who, as far as he can remember, always suffered from a symmetrical disposed eruption of a scaly appearance. Anamnesis otherwise, as well as family history good. The skin under the axillæ, in the substernal regions, around the umbilicus, on the buttocks, and on the groins, is covered with an eruption in the form of symmetrically disposed, distinct spots, covered with grayish-white scales that cannot be removed mechanically, and that feel rough to the touch; the spots are of variable size. The axillary spaces are partially covered with a thick stratum of scales, and the same to a greater or lesser extent is seen in the other above-mentioned localities. Examination of the nervous system developed nothing abnormal outside of a moderate dermographism. The clinical feature of the case, according to Znamensky (Roussky Vratch, No. 22, 1903), lies in the localization of the eruption, which is usually described as affecting the entire body, also in the remarkable symmetry of disposition of the spots on either half of the body. Treatment proved quite unavailable, so much so that the patient as one suffering from an incurable affection was dismissed from military service.

## NEUROLOGY.

**Relation of Neuralgic Headaches to Storms.**—A unique research in connection with this subject has been made by S. Weir Mitchell (Am. Med., June 27, 1903), who presents some very interesting observations in this little understood field. The originating causes of hemicrania are as yet unknown. He asserts that eye-strains are rarely the primary trouble, but they may add to the number and exaggerate the force of the attacks. Fatigue, worry, etc., have a certain influence, and atmospheric conditions have a potent share. He has observed this in a number of instances and reports in detail the history of one case, in which a record of the attacks was kept for seven years. The pain curve was seen to follow the storm curve for that period. Electric storms were not among those which exerted any influence. March and April were the worst months and October and February the best. Nothing definite can, of course, be based upon these data and the author suggests that further observations be made by recording the dates of attacks in afflicted individuals for a period of two years and comparing them with the storm curve for the locality for the same time.

## HISTOLOGY, PATHOLOGY, BACTERIOLOGY.

**Cysts of the Peritoneum Covering the Fallopian Tubes.**—The frequency with which these small cysts are met with must be familiar to all those who work in gynecology and pathology, remarks T. G. Dickson (Am. Jour. of Obstet., June, 1903). They are practically always con-commitant with neoplasms of the generative organs, or the more serious inflammatory diseases of the tubes. They seem to be found most frequently with myomata of the uterus, and salpingitis. Because of their benignity and small size, they are incapable of producing clinical symptoms. As regards their naked-eye appearances, these cysts are occasionally single; more often, however, they are multiple. They vary in size from those which are not visible to the unaided eye to those which are four or more millemeters in diameter. Their location is most often on the anterior and upper surface of the tube. Still they are not infrequently found in other locations. The peritoneum covering the ampulla of the tube contains them most frequently. They are spherical or lenticular in shape, containing a clear or opalescent fluid, and, in tubes without marked perisalpingitis, can be moved freely over the musculature with the peritoneum. They are variously considered as springing from congenital anlage, derived from existing lymphatics, or due to peritoneal inclusions. The author considers that with the character of the cell-lining, such as they have, they come from three sources, namely, the mesothelium in the peritoneum, the endothelium of a blood-vessel, or the endothelium lining lymph-spaces. An origin from blood-vessels seems unlikely, because of the absence of blood in the cysts, and also on account of the absence of elastic tissue in the cyst wall. In the writer's opinion they are dilated lymph-spaces, and are associated with those diseases of the tube and neoplasms of the generative organs which are capable of interfering with the free circulation of the lymph in the tubal peritoneum.

## THERAPEUTICS.

**Action of Somnoform.**—This is the commercial name of a new anesthetic containing ethyl chloride 65 per cent., methyl chloride 30 per cent., ethyl bromide 5 per cent. It has been very largely used in France for producing anesthesia for minor operations. Sydney W. Cole (Brit. Med. Jour., June 20, 1903) reports a series of exhaustive experiments, made at the physiological laboratory, Cambridge, from which he deduces the following conclusions: (1) The chief danger attending the use of this mixture is that it may paralyze respiration. Most careful watch, therefore, must be kept. (2) Owing to the depression or paralysis of the peripheral endings of the cardio-inhibitory fibers and the comparative slight action on the heart itself there is no danger of heart failure, provided respiration has not yet ceased. (3) After cessation of the respiratory movements it is easy to restore the animal by artificial respiration. The author thinks that the paralysis of the cardio-inhibitory fibers by ethyl bromide renders that drug a very valuable anesthetic. Embley has shown that the sudden deaths which sometimes occur during chloroform narcosis are due to inhibition of the heart by stimulation of the cardio-inhibitory center. This is usually seen only in the early stages of chloroform administration; the danger passing off when the medullary centers are exhausted. This suggests the advisability of combining ethyl bromide with chloroform. If in anesthesia produced by ethyl bromide the vagi are paralyzed, chloroform would then be deprived of one of its greatest dangers. It might be possible to get past the stage of excitement with the bromide and, after reaching medullary depression, to maintain anesthesia by chloroform alone, the bromide being stopped because of its depressing effects on respiration.

**The Further Use of Bacterial Vaccines.**—It will not be so very long before the surgeon, who, after all, is a sort of executive slave to the internist, is put on the shelf altogether. A. E. Wright (Brit. Med. Jour., May 9, 1903) looks forward most hopefully to the time when vaccines shall be so perfected as to immunize human beings against the colon bacillus, to say nothing of the staphylo- and streptococcus. Without the ravages of these groups, the surgeon's hand would indeed be stayed. The high standing of the author, as well as the prominence given his paper by the *British Medical Journal*, is warrant for a close observation of his suggestions and conclusions. He says "The colon bacillus, even if we consider it quite apart from its near congeners, the dysentery bacillus, the Gaertner bacillus and the typhoid bacillus, all of which, like the colon bacillus, affect the lower part of the gut. The rôle they play in internal surgery is kin to that of the staphylococcus externally. The gravity of the local process is infinitely graver, first, because of the importance of the organs involved; secondly, from the impossibility of applying antiseptics safely, and thirdly, from the very grave nature of the surgical measures which must be necessary in the event of serious infection." Cholelithiasis is, no doubt, the most important—always excepting appendicitis—of the ills directly attributable to the colon bacillus. Cystitis, meningitis, endometritis, mastoiditis and arthritis are all considered in turn. It is seen that while the results are not by any means brilliant there is enough of encouragement to keep interest in this matter of prophylactic medicine at a high pitch. Progress can only be made if the existence of the negative and positive phase is noted and an effort made to find more exact data upon which to base a recognition of a higher base line of immunity. Until this effort is successful the vaccines cannot be constantly brought to their highest point of efficiency.

**Practical Experiments in the Treatment of Anemic Conditions.**—A series of practical tests have been made with the ferruginous preparation known as Peptomangan (Gude) in other conditions beside chlorosis and anemia, for which it has been particularly recommended. In all diseases attended with weakness and exhaustion, F. Euler Rolle (Wiener klin. Rundschau, March 29, 1903) found that it caused marked improvement and also maintained to some extent the nutrition of the patient, by reason of the peptone which it contains. One series of cases included tabes with gastric crises, vomiting of pregnancy, cancer of the esophagus, diabetes mellitus, arthritis and uric acid diathesis, and leucemia. In all of these cases the improvement could be demonstrated clinically by determinations of the body-weight, by the condition of the gastro-intestinal tract, and by microscopical examination of the blood. It is known that most ferruginous preparations on the market consist of albuminous material held in solution by an excessive amount of caustic soda, thus neutralizing the gastric juice, or through their decomposition the irritating chloride of iron is produced. Others represent peptone combinations containing an excessive amount of mineral acids and, therefore, are precipitated by the alkaline intestinal secretions and rendered less assimilable. Pepto-mangan does not seem to share these disadvantages and owing to the presence of manganese, is an excellent carrier of oxygen. No unpleasant after-effects have ever been observed.

**The Use of Arsenic in Chorea.**—The value of arsenic in chorea of the infectious or rheumatic type is questioned by H. Roeder (Fortsch. d. Med., July 1, 1903). He made some very careful clinical observations in a number of children who received arsenic in the form of arsenical mineral waters or Fowler's solution, in increasing dosage up to 12 drops t.i.d. In most of the cases there was found after the twelfth day, a sudden or a gradual rise of temperature and an accelerated pulse. There was also noted systolic murmurs over the apex, stenocardia or arhythmia, and increase in the area of cardiac dulness. The subjective symptoms also grew worse and there was apt to be a recurrence of the previous rheumatic conditions. Digestive disturbances resembling the typhoid state were often present. In most cases, as soon as the drug was stopped, the patient improved, but in the severe cases permanent harm resulted. The author states that in the neuropathic type of chorea, he has not observed these detrimental effects. He is unable to explain the toxic effects of the arsenic in the one case and its absence in the other.

**Veronal, a New Hypnotic.**—This new drug, first introduced, a short time ago, by E. Fischer and v. Mering, has since been tried by a number of men, the last report being by F. Lotsch, of the 'Charite' in Berlin (Fortschr. d. Med., July 1, 1903). He employed the drug in 30 cases of various types and found it of especial value in insomnia which was not due to pain. The effect was prompt, a natural sleep coming on usually within half an hour, and no unpleasant after-effects were observed on awakening. In doses varying from 0.25 to 1.0 gram, it may be given for a considerable period. It is, relatively speaking, non-toxic, is readily soluble and almost tasteless. It has no effect on the heart and kidneys, and in cardiac cases, with poor compensation it semed to be of especial value. The cost is also somewhat less than that of the other newer hypnotics.

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## A NEW POINT IN MEDICAL JURISPRUDENCE.

It has usually been held in the courts at least in the few cases that have come to trial, that an amputated limb or a removed tumor, is the property of the patient and that he has the right either to dispose of it as an anatomical or pathological specimen—or, as in the case of Jackson, to have it buried with full eccleciastical rites. The case of "*Palear versus Jenkins*," however, that is now coming to trial in Chicago, presents a different point, that smacks rather of equity than law, and which seems to give more grounds for damages than for a simple charge of theft.

Custom is always a difficult thing to overcome, and habits when long continued are hard to break. We all grow used to conditions that are continuous, and are often much more disturbed by their sudden cessation than we were in their occurrence. Thus the miller does not heed the noise of his wheel while it is in motion, and nothing rouses the captain of a vessel from his sleep so quickly as the stopping of the machinery.

All this makes it trying to a person who is suddenly confronted by a radical change in what he is thoroughly accustomed to, and this change becomes almost unbearable when it is associated with personal loss, or a feeling of injury. This, too, is more accentuated when the wrong is inflicted by one who has been trusted, and who has been sufficiently intimate to have been a companion in unusual and singular experiences.

It seems that Mr. Kasmar Palear, of Wade St., Chicago, has been not only a victim of misplaced confidence and reptiles, but has also had the bad luck of becoming a most striking illustration of "Man's inhumanity to man." Several years ago Mr. Palear swallowed a lizard, still in its tender youth, and has ever since nourished it, until it can be fairly said to be a second nature to his own. This act of hospitality has, it is true, been hidden from the world. But deep down in his vitals, Kasmar has been conscious of it, and his feelings have been constantly stirred with the warmth and glow of a knowledge of benefits bestowed.

Only a few days ago this Chicago landlord—a very host within himself—parted suddenly and in anger with his tenant, in the presence of a friend. This appears to have been a certain Mr. Jenkins who, up to this time it seems, had played the rôle of Boswell to his Johnson and occupied the position that Hennessy now fills for Mr. Dooley. What the cause of the rupture was we cannot say. It may have been one of the cases, in which out of the fulness of the heart the mouth speaketh: or he may have been a truant lizard that thought his home a cage. At all events, he appeared on the scene as green as the leaves of the forest in summer, and dotted with spots as unchangeable as those of the leopard. Poor Palear was stupefied, for he was in the position of the man who with honorable intentions had long corresponded with the object of his affections, without a personal interview, and suddenly discovers that he had builded better than he knew. But if he was dazed his quandam friend was not, and off he started in pursuit.

It was, it seems, a case of up Jenkins and down lizard from the start. At last he captured the errant reptile, and now he claims it for his own. To this Mr. Palear will not agree, and in a sworn statement he declares that he has been robbed of what has long been an integral part of his personal estate. He claims also that it has a cash equivalent, and that he has been feloniously deprived of ten inches of lizard, valued at twenty dollars per inch, and that Mr. Jenkins having been present at the first interview, is fully cognizant of these facts. To these allegations Mr. Jenkins offers no demurrer, but claims the thing is his, by right of capture and his own strength of nerve.

What the judge will rule is hard to say. The legal points are delicate and involved, as the statutes on landlord and tenant do not apply, the lizard having vacated voluntarily. As yet Mr. Palear has made no demand for unpaid rent. Neither has Mr. Jenkins sufficient authority to class the lizard's occupation as eminent—though it was certainly extraordinary—domain.

As to our sympathies, they are with Mr. Palear—*he had it first.*

## KIDNEY DISEASE AND INSANITY.

Studies of the excretory organs and excretory functions are gradually bringing to light corroborative evidence of the autotoxic theory of insanity. Unfortunately, such studies have, for the most part, been limited to some observations on the kidneys and the urine. The unusually frequent association of kidney disease with the various forms of insanity has been repeatedly shown and statistically proven during the past few years. If the kidneys are called upon to excrete an increased quantity of indican and the sulphates in some forms of insanity (Hamilton and Turner), or an increased amount of xanthin compounds or of uric acid (Haig), or even an occasional poison like acetone (Wagner), demands are made upon these organs which will ultimately show themselves in well-marked kidney lesions.

The observations of Bristowe on paresis, in which he found a gross kidney lesion in 88 per cent. of his cases; Beadles' figures for 150 post mortems in insanity in general, 70.6 per cent., and Prout's figures for a like number of autopsies, 69 per cent., are fairly well known. The extreme frequency of kidney lesions in paresis has been especially noted by both Bristowe and Prout.

Beadles compared his figures with some statistics from St. Bartholomew's Hospital. In 194 deaths from all causes in persons over thirty years of age, 48 per cent. showed a gross kidney lesion at autopsy. If the cases of insanity under thirty years of age were excluded from the figures given by Beadles and Prout, the percentage of kidney lesions in the remainder of their cases would be much higher.

Perry has recently published some observations on this subject and has carried his investigations a step further than the autopsy table (Transactions of the Medical Association of Georgia). He finds evidences of nephritis in 33.7 per cent. of the cases admitted to the Georgia State Sanitarium and in 70 autopsies the percentage showing kidney lesions was 85.5 per cent.

Unfortunately there is no tabulation of the ages of the patients in either the urinalyses on admission or the autopsies. The author found casts in the urine, when albumin was absent, in 19.1 per cent. of the cases examined on admission. He considers this together with the very great frequency of the occurrence of cylindroids, as evidence of long standing renal irritation. Another fact of much importance pointed out by this author is the extreme frequency of arteriosclerosis (88.5 per cent.). Here again we miss the tabulation of the facts, according to the ages of the patients; the author states its occurrence, however, in a number of cases under thirty years of age.

All these changes are probably of secondary rather than of primary origin, but their importance is of the first rank. Cardiac hypertrophy would suggest itself as one of the first sequences of changes of this character, but no adequate statistics are at hand in support of this theory. Some work has been done on valvular heart lesions in the insane, but thus far no systematic efforts at determining the cardiac area in all cases of insanity have been made. The great therapeutic importance of determining this point is obvious. The various organs of the body have received too little attention at the hands of both asylum clinicians and pathologists, the tendency being to skip hurriedly over the internal organs and to spend much valuable time on the brain, an organ our knowledge of the physiology of which is so limited that no investigations except those of the most painstaking and exhaustive type can be of any value whatever. Unfortunately, the requisite knowledge of the undertaking of work of this character and the opportunities for acquiring it, are rather limited with us.

Some fields of investigation are, however, directly accessible and would well repay investigation. The liver, the lungs, the skin and blood states in the insane in general, have been almost entirely neglected in the impatient haste to get at the brain with faulty methods and a technic more faulty still. If the autotoxic theory of insanity is correct, the various organs of the body having any major part in the processes of elimination should be investigated first for corroborative evidence of it.

Perhaps no research would bring larger returns in the shape of practical discoveries than a systematic and extensively conducted investigation of the changes that take place in the blood and the secretions and excretions of these patients.

### THE UNIVERSITY IN MEDICAL EDUCATION.

One of the few opportunities out of the pulpit that is afforded to preach ethics and high standards, comes to men eminent in their profession when they are invited to address a graduating class at a University commencement. Doubtless the best idea of a nation's ideals and aspirations can be obtained from such addresses, and a better appreciation of educational values has been brought about by the long established custom.

The annual address to the graduating class of the Yale Medical School given by Dr. Henry M. Hurd of Johns Hopkins Hospital, and published in *Science*, contains suggestions that are pertinent to all interested in medicine.

After tracing briefly the circumstances of medical education in America, he shows the two methods by which different colleges and institutions approach the question "How shall medical education be studied." On one hand there is the opportunity given to the student to begin his medical work in the third year of college, and to combine his studies for his bachelor and medical degree. On the other hand there is the tendency to divorce the medical question from the college course and to pursue the latter independently. While the first mentioned is the more practical method, and the one most likely to be in vogue, the latter tends more to general culture.

Dr. Hurd maintains that the present requirements for medical education have become so extensive and exacting, that schools which have hitherto been maintained as commercial ventures, and for the private gain of their owners, can no longer be profitable if they honestly seek to do their duty towards the student. Such schools although making the most praiseworthy efforts to fit men to be doctors, do little for the science of medicine. He holds that the present situation demands that schools connected with universities shall perceive the need of the student, and protect him from imposition by affording him instruction of a high standard, and that the university should set the standard. The country suffers from too many imperfectly educated men. The university is alone competent to limit the production and to improve the quality.

The intensely practical nature of the studies of a physician are by no means undervalued by Dr. Hurd, but he holds that in view of the tremendous scientific achievements of the last half century, and the possibilities of still more brilliant work, that the medical school needs every advantage that the university can afford.

## ECHOES AND NEWS.

### NEW YORK.

**Prevalence of Trachoma.**—Dr. John C. Lester, assistant surgeon of the New York Eye and Ear Infirmary is authority for the statement that there are at least 25,000 cases of trachoma in this city. The disease is common among foreigners and they are largely responsible for its spreading.

**Board of Health Clinic.**—Plans have been filed at the Bureau of Buildings for a one-story brick clinic, 25x80, to be erected at No. 965 Sixth avenue, for the purpose of examination of patients thought to have contagious diseases. There will be an X-ray room, throat examination room, drug store, two clinics, and a general examination and waiting room.

**Bellevue and Summer School of Philanthropy.**—Fifty members of the Summer School of Philanthropy paid a visit to Bellevue Hospital last week. They spent some time in the office of Dr. William Mabon, the superintendent, where the workings of the hospital were explained to them. In company with one of the staff doctors and a nurse they visited all the departments.

**Cost of Enforcing Dog Ordinance.**—The Aldermen, upon receiving from Mayor Low a statement to the effect that President Haines of the Society for the Prevention of Cruelty to Animals wanted $76,800 a year to carry out the recently enacted dog-muzzling ordinance and would need $26,000 of it immediately in order to enforce the regulation during the hot weather, referred the matter for an early report to the Committee on Laws and Legislation.

### PHILADELPHIA.

**Dr. Stelwagon Honored.**—Dr. Henry W. Stelwagon, Clinical Professor of Dermatology at Jefferson Medical College, has been elected to honorary membership in the National Dermatological Society of France.

**Baby Directory to Cover Entire City.**—The Bureau of Health has decided to apply the system of visiting and registering babies under one year old to the entire city instead of to the district south of Spruce and east of Broad street, as originally planned. The entire force of fifty District Physicians have received instructions regarding the work which will begin as soon as the registry cards and circulars are ready. It is considered quite probable that the present force of fifty physicians and sixty nurses may have to be increased before the end of the summer.

**Mothers to be Instructed in Care of Children.**—Plans to give a series of plain talks to mothers on the care of babies are being perfected by Dr. Martin, Director of the Department of Health. Nine physicians have volunteered their service to carry out the work. The lectures will be held under the auspices of various church guilds, day nurseries, the College Settlement and the Pennsylvania Congress of Mothers. All these centers will arrange localities and fix the date for the physicians to give their lectures. A circular outlining the topics to be treated by the physicians in these talks has been prepared by Dr. Martin. Special efforts will be made to reach the mothers who do not understand English.

**The Municipal Hospital Affair.**—Since the appointment of the Director of Health and Charities there have been comments upon the frequent appearance of newspaper interviews regarding the work of that department. While the great majority

of these interviews have been entirely innocuous, it was thought by the more conservative that many of the criticisms (even though they were just) on existing affairs, as well as plans for the future, should be given less publicity. As a logical outcome of this newspaper campaign there has appeared an undesirable controversy regarding the management of the Municipal Hospital. As to whether the severe strictures upon Dr. Welch's management of the hospital made by Dr. Martin are deserved we are not at present concerned. Dr. Martin undoubtedly found at the Municipal hospital many things that were not as they should be. Some person or persons are responsible. Whoever he or they may be, Dr. Welch can hardly be blamed for replying to the following which is part of what was quoted in one of the leading daily papers as coming from Dr. Martin regarding the hospital: "I cannot understand how the institution could have been conducted in the past to bring about such a deplorable condition both as regards equipment and organization. People suffering from contagious diseases are compelled to go there, and it is not too much to say that they run great risks of not only failing to be cured, but of contracting other diseases from neighboring patients. I am astounded at the gross negligence which has characterized the management of the Municipal Hospital. The equipment and the discipline are almost a disgrace to the city, and will need the concerted attention of the Health Department to bring the institution to the condition in which it ought to be for the reception of patients. Dr. Welch is undoubtedly responsible to some extent, but just how far I do not know. We are making a very searching investigation to determine who is to blame. There is no fault to be attached to the Councilmen, for they have had no appropriation measures submitted to them for consideration. The whole matter has arisen from the neglect of the management of the institution to apply for aid from the city in the proper and customary way. And this neglect is typical of the general conduct of the hospital in the past. It passes comprehension how men to whom its affairs have been intrusted could allow it to become so run down." On the other hand, the statement that Dr. Martin's accusations are prompted by the outcome of last year's factional contest in the County Medical Society over the endorsement of a candidate for President of the Medical Society of Pennsylvania, is unworthy of its originator. The members of the Medical profession in Philadelphia will welcome needed improvements in any service that comes under the jurisdiction of the Director of Health and Charities and stand ready in every way to aid the Department, but they deplore the present publicity of criticisms emanating therefrom.

**Smallpox and Red Light.**—The suggestion to combat smallpox with the red light treatment has been abandoned by the health authorities in Philadelphia after consideration. It is an old idea, centuries old in fact, and is said to have been put in practice by the Arabians. Prince John, a son of one of the Edwards, was treated by this system. Everything was red. He was even given mulberry wine on account of its color. The theory is that daylight, and especially the chemical rays, have an injurious effect on smallpox patients, inasmuch as the strong rays of the sun cause inflammation or sunburn in healthy persons. But experiments at the Municipal Hospital in Philadelphia did not confirm this theory. Only negative results were obtained there, as in other hospitals where the treatment has been tried. In Philadelphia the room used was painted red and had red glass windows. Red curtains obscured the doors and red globes covered the gas jets. The patients were neither harmed nor benefited. Within the last year a red light ward for the treatment of smallpox was constructed in the hospital in Indianapolis. One hundred and forty victims were put in this new ward and by way of experiment the same number of cases was placed in the ordinary ward. The results showed that the red light treatment was neither baneful nor beneficial, and the treatment was abandoned. In Norway and Belgium the red light treatment for smallpox is used extensively and they contend with success in reducing the mortality list. But it is well to remember that in those countries vaccination is the universal practice. Reason, as well as tests, disprove the theory. Diffuse rays of light are not capable of inflaming the skin. Only the strong light of the sun does that. The negro has the best possible protection in his skin against the action of the rays of the sun, and yet negroes have more occasion to dread smallpox than white people have. So, too, if the actinic rays of the sun aggravate the eruption of smallpox, then the smallpox in summer ought to be worse than the smallpox in the winter. Yet smallpox is usually more severe and more abundant in winter than in summer.

## CHICAGO.

**Fewer Contagious Diseases.**—Only 57 cases of the contagious diseases—diphtheria, measles, scarlet fever, smallpox, etc., were reported during the week ending July 18th. This is the lowest number since September, 1901. In the corresponding week last year there were more than twice as many—119—and the 34 cases of diphtheria and 14 cases of scarlet fever reported this week are one-third and one-half less than the respective number reported during the previous week. Measles, which has been epidemic for many months, is fast disappearing, as also is smallpox, the solitary reported case of which was that of an unvaccinated infant of 6 months.

**Decrease in Infant Mortality.**—During the week ended July 18th there were nine fewer deaths in children under one year of age than the week before, and 25 fewer than the corresponding week of last July. A more marked result is seen in the fewer deaths among the aged, those over 60 years. This decrease in mortality in the two extremes of age is due to the "summer resort" weather Chicago has been having.

**Personal.**—Dr. N. Senn is taking his vacation in the West, visiting Rock Springs, Wyoming; the Yellowstone Park, and from there he will go to the Yosemite Valley.

**Mortality Comparison.**—During the first six months of this year a total of 15,201 deaths from all causes were reported, giving an annual death rate of 16.24 per one thousand. This is an increase of 3,103 deaths over those reported for the first six months of 1902, and an increase of 18.5 per cent. in the annual rate in proportion to population. Of the causes of death showing the greatest rate of increase were typhoid fever, 154 per cent.; scarlet fever, 147 per cent.; measles, 136 per cent.; pneumonia, 60 per cent.; Bright's disease, 58 per cent.; acute intestinal diseases, 29 per cent.; suicide, 24 per cent.; consumption, 17 per cent.; heart diseases, 14 per cent. Pneumonia causes 3,133 deaths in these six months, as against 1,961 in the first six months of 1902, and consumption 1,561 and 1,325, respectively.

## GENERAL.

**Appointment of Professor Kraepelin.**—Dr. Emil Kraepelin, professor of psychiatry at Heidelberg, has been called to Munich.

**Library of Professor Schede.**—The library of the late Professor Max Schede, formerly director of the surgical clinic of the University of Bonn, has been presented to the clinic by his widow.

**Retirement of Prof. Huppert.**—Dr. Carl Hugo Huppert, professor of medical chemistry at the German University of Prague, will retire at the end of the present semester.

**Appointment of Dr. Page May.**—At University College, London, Dr. Page May has been appointed lecturer on the physiology of the nervous system.

**McGill Appointments.**—The following appointments have been made at McGill University: Dr. J. G. McCarthy, to be assistant professor of anatomy; Dr. J. T. Halsey, to be assistant professor of pharmacology and therapeutics; Dr. R. A. Kerry, to be lecturer in pharmacology and therapeutics; Dr. S. Ridley Mackenzie, to be lecturer in clinical surgery; Dr. John McCrae, to be lecturer in pathology; Dr. D. A. Shirres, to be lecturer in neuropathology; Dr. D. D. McTaggart, to be lecturer in medico-legal pathology.

**Gift to McGill University.**—The late James Cooper gave $60,000 to form a fund from which to pay the cost of establishing, in the medical faculty of McGill University, a chair for the teaching and study of internal medicine, on lines to be determined by the medical faculty itself. This will be known as the Cooper endowment fund, and will be paid two years after the death of the testator.

**Medical Department, University of Texas.**—Since the publication of the last catalogue a private benefaction has been placed in the hands of the Regents in the form of a five-year endowment for University Hall. Following the purpose of this donation and conforming with the original purpose of the donor of the Hall the Regents have determined to remove from the building the University Hall Dining Club and to devote the entire hall to the uses of the women students. By this arrangement the hall will be under the control of a matron appointed by the Board of Regents; and the rooms, with the light, heat, water and service will be furnished at a low rental to the women students of the institution who may elect to take up residence in the building. The present Board of Lady Managers is continued as an advisory and visiting board; but all questions of management are assumed by the authorities of the school. It is felt that with the improvements thus made possible in the material and general conduct of the hall it will prove an admirable home for the women who are in attendance in the schools of medicine and pharmacy. In addition there have been provided two scholarships, by the Woman's Club of San Antonio, granting to the holders the sum of two hundred and forty and two hundred dollars, respectively, annually; these are to be given to those two women in the medical class who after the freshman year shall have attained the highest general averages of proficiency in their studies.

**Trypanosoma, the Tsetse Fly and the Sleeping Sickness.**—A highly interesting and important pamphlet has just been issued by Prof. Ray Lankester and his assistants of the British Natural History Museum in relation to the suspected connection between the tsetse fly and the sleeping sickness which has been making such havoc in certain parts of southern and western Africa. Col. Bruce discovered that the tsetse fly produces the death of horses and cattle by introducing into the blood of its victims a minute parasite, and in the early part of this year Dr. Castellani, a member of the Royal Society Commission, sent to Uganda to investigate the sleeping sickness, found this parasite in the cerebro-spinal fluid of nearly 70 per cent. of the cases of sleeping sickness examined for this purpose by him at Entebbe in Uganda. Until recently, it was supposed that the tsetse fly was inseparable from the African buffalo, and could only exist in districts inhabited by that animal. But this theory is now much doubted. Sir Charles Eliot, Commissioner and Consul-General for British East Africa, is convinced that the buffalo cannot be the only host of the parasite which the tsetse fly introduces into the blood of domestic animals. Commissioner Sir Alfred Sharpe declares that the tsetse flies appear to depend upon wild game for their existence, as he had never found them where game was nonexistent, but does not think that they are in any way especially dependent upon buffalo. Mr. F. J. Jackson, Deputy Commissioner for British East Africa, is firmly of the opinion that in East Africa the existence of the tsetse fly was never in any way more closely connected with buffalo than with any other species of game, and expresses his conviction that the tsetse is, like the mosquito, only a bloodsucker by predilection.

**Our Chaotic Food-laws.**—Under this caption the New York *Evening Post* very soundly says: Professor Wiley's report on his "poison-squad" experiments is not to be made public, it seems, until October. But recently, in an address at St. Paul, he made it pretty plain that they have only confirmed the position of the German Government—namely, that the use of food preservatives is harmful to health. Some preservatives, at any rate, Professor Wiley admits to be "deleterious," and he urges legislation, both national and State, to prevent food adulteration and the use of pernicious preservatives. The safeguards provided by the new law against impure or falsely labelled foods and wines imported from abroad are, indeed, in striking contrast with the inadequate and confusing statutes which are supposed to protect us from adulterated and injurious food products at home. By the act which went into effect on July 1, the Secretary of Agriculture is clothed with authority to confiscate any shipments of objectionable foreign foods at the Custom House, although, in the Attorney-General's opinion, his jurisdiction does not apply to such as are imported in the pure state, and adulterated or falsely branded afterwards. It is a law which, wisely and thoroughly enforced, should shield effectually the customers of the "fancy grocery store." Meanwhile, how do we stand with reference to domestic products, compared with which imported food is trifling in quantity? Many of the States, especially in the East, have food laws. Some have good laws, earnestly enforced; some good laws with no machinery to carry them out; some lax laws, and some no laws at all. There is no uniformity except in so far as the States have copied one another's statutes. It is a remark of Professor Wiley, Chief of the Department of Agriculture's Bureau of Chemistry, that a food manufacturer requires the services of a lawyer to see that the laws of the different States are complied with merely in the matter of printing labels. Take the case of a jam or a jelly containing glucose in place of cane sugar: in Ohio or Massachusetts its label must show the exact proportion of each ingredient ac-

cording to analysis. In Minnesota, the label "adulterated mixture" must be affixed to this same jam, in Pennsylvania "compound," and in Illinois "imitation." In this State, the law can be complied with by the declaration in fine type around the edge of the label in the guise of an ornamental border that the preserve "contains a small amount of corn syrup [glucose] to prevent crystallization." It is often illegal to sell in one State a product which was put up in strict conformity with the law of its next neighbor.

Toward remedying this chaotic condition, Congress has done almost nothing. The Hepburn National Pure Food bill which passed the House last winter, reached the Senate late in the session and died there. At the demand of the dairy interests, however, a discriminating tax was placed on oleomargarine colored as butter is colored, though this is a perfectly wholesome article of food. Protection against one form of deception is also afforded by the act which makes it a misdemeanor to introduce into any State a dairy or food product falsely labelled as to the locality of its production. This law was introduced by Representative Sherman of this State, and was designed especially to prevent the branding of cheeses produced elsewhere, as the famous "New York full cream cheese." So far as the national law is concerned, it makes no difference whether the product is really a full cream cheese, provided it were made in New York. The fortified wines, then, the borax-preserved sausage, the reimported cottonseed oil, masquerading in the guise of "pure olive," and the French peas colored with copper, Congress is resolved to keep from our tables. It does not concern itself with the "pure maple sugar" which never saw a maple tree, the "comb honey" made of paraffin and the indispensable glucose, the low-grade flour whitened with alum, the dilute acetic acid which passes as vinegar, the red wood and charred peanut shells in spice boxes, or the strawberry jam made of flavored and tinted glucose and gelatin mixed with timothy seed, all of which are domestic products. The workingman may be sure that his *petit pois* and cognac are all that could be desired, however much doubt there may be as to his bread and salt. The consumer of impure food is cheated even when he is not poisoned. If he wishes to economize by using oleo or the euphemistic "corn syrup" on his table, that is his own concern, but it is unfair both to manufacturers and buyers if these things can be put on the market as maple sugar and butter. If all the States had good food laws and enforced them, a national law might be unnecessary. As it is, one of the chief difficulties of city health departments is to hunt down the impure food products brought in from other localities. It is comparatively easy to hold the manufacturers to account, and a single rigid inspection of a factory may result in holding back from the market large quantities of deleterious food products. It is a very different matter to seize a half-dozen packages of this same food at a corner grocery store, and then throw the responsibility back upon the maker who may have violated no law of his own State. The national statute would not only stop shipments of the harmful commodities from one State to another, but also furnish a model for those States which have not yet passed food laws of their own.

**Explosive Bacterial Products.**—The comparatively new method of purifying sewage by encouraging the growth of certain forms of bacteria in it, while it is retained in closed tanks, has recently led to several serious and novel accidents in England. Certain inflammable and explosive gases are formed during the closed tank stage. These have in three instances, viz., at Exeter, Walton-on-Naze and at Sheringham, exploded with more or less serious results. At Sheringham the explosion killed three persons and seriously injured several others.

**Obituary.**—Dr. John Evans Walker, a prominent physician of this country, well known throughout the South and in New York city, died July 24th of hemorrhage of the brain. At one time he was the immigration medical inspector at Ellis Island, New York.

Dr. Milo Hotchkiss Jones, son of Dr. Leander P. Jones, and assistant to his father, the health officer of Greenwich, Conn., died last Monday of a fever contracted two weeks ago while attending to his duties. He was only twenty-eight years old. He was graduated from the Yale University medical department and practised for a year in Bellevue Hospital, this city.

## OBITUARY.

### DONALD MACLEAN, M.D., LL.D.

Dr. Donald Maclean, ex-president of the American Medical Association, and until recent years one of the most widely known surgeons in the Middle West, died at his home in Detroit, Michigan, July 24th. He was born at Seymour, Canada, December 4, 1839, of Scotch parents, his father, a man of brilliant attainments, in spite of his total blindness almost from infancy, being an eminent lawyer and leader of the Canadian Bar. At the age of six, young Maclean was sent to a famous school for boys at Edinburgh, where he remained six years. When sixteen years old he matriculated at Queen's College, Kingston, Ontario, from which institution he was graduated in 1858 with the degree of Master of Arts. During the summer of the same year he returned to Edinburgh and began his medical studies at its University, receiving his degree of Doctor of Medicine and his license from the Royal College of Surgeons, Edinburgh, August 1, 1862.

During the last year of his medical course, and throughout his subsequent hospital service, he was closely associated with the celebrated Professor Symes, and to this surgeon's influence and teaching he always attributed his own success in surgical practice in after years. Many years after graduation he edited and published, largely at his own expense, an Americanized form of his preceptor's "Principles of Surgery," which, however, never attained great popularity as a text-book in this country.

In January, 1863, Dr. Maclean returned to America, and immediately entered the United States Army as acting-assistant surgeon. In 1864 he resigned in order to accept the chair of clinical surgery in the Royal College of Physicians and Surgeons at Kingston, Ontario, which position he retained until 1869. In 1872 he was appointed professor of surgery at the University of Michigan at Ann Arbor, where he remained seventeen years. In 1889 he severed his connection with the University and removed to Detroit, where he quickly built up a very large practice. In 1893 the degree of LL.D. was conferred upon him by Queen's College, Kingston, and in 1894, at the San Francisco meeting, he was elected president of the American Medical Association, the duties of which position he

discharged with dignity and discretion. On the breaking out of the war with Spain he accepted a commission as chief surgeon with the rank of major and was assigned to duty at Fortress Monroe, thus reentering the service of the United States after an interval of thirty-four years.

During the past two years his health had gradually failed and he had entirely given up active practice. The immediate cause of his death was gastro-enteritis.

It falls to the lot of but few men to possess the friendship and esteem of those with whom he came in contact, in like measure with Dr. Maclean. Ever going out of his way to lend a helping hand to those less successful in the battle of life than himself, his purse always open, during his active career he was the embodiment of all that is noblest in the life of a physician. Tenacious of his opinions, like all Scotchmen, a master of argument, yet he was unequaled in courtesy, unvarying in his inability to cause pain to the most sensitive. He loved well and, like all strong personalities, he hated well, but few of those who were most closely associated with him and who knew him best ever plumbed with certainty the depths of his feelings. Oftentimes an avowed enemy—an enemy only because of differences in opinion—became his warm friend, unable to withstand the influence of his honest, lovable nature, but never did a friend become his enemy.

## SOCIETY PROCEEDINGS.

### HARVARD MEDICAL SOCIETY OF NEW YORK CITY.

*Regular Monthly Meeting, held May 23, 1903.*

The President, Frank Daniels, M.D., in the Chair.

**Some Medical Features of Life Insurance.**—This was the subject of the paper of the evening by Dr. Augustus S. Knight.

**Heredity and Brevity of Life.**—Dr. Knight said that the occurrence of short-lived families, members of which died at comparatively early ages, was now generally acknowledged as the occurrence of distinct heredity longevity in other families. Hence the necessity for careful gleaning of the family records for life insurance purposes. Certain families seem to have much less resistance to acute and chronic disease, besides their tendency to inherit certain specific diseases. Gout is a question of inheritance largely, and it is well understood that the condition of arteries which predisposes to apoplexy is also inherited.

**Cancer and Life Insurance.**—Very often the existence of cancer in families is denied at the time of medical examination, though subsequent revelations show that it has been present. Malignant disease constitutes the main reason why life insurance for women has never proved a successful feature of the business. While women live longer than men in the general mortality statistics, and while the medical examination ought to secure only the selected lives among women, somehow the mortality statistics of these selected lives were never as favorable to the company as the selected lives of men insured.

**Underweight and Overweight.**—Individuals who are under the normal weight are not favorable subjects for life insurance for two reasons. First, because of their liability to phthisis, and secondly, because of a special tendency to nervous diseases of various kinds. It seems probable that many of the cases of underweight, which later develop phthisis, are really examples of undiscovered tuberculous lesions of the lungs, or cases of latent or partly healed tuberculosis. Persons who are overweight are quite as unfavorable subjects for life insurance. They succumb especially to acute diseases, to surgical operations and to accidents. They have a special liability to heart complications and to apoplexy. Such persons usually eat too much and take very little exercise and thus throw a heavy strain on their heart arteries and eliminating apparatus. The statistics of life insurance companies show that persons who are overweight are especially liable to apoplexy and to heart complications of various kinds, and that in them accumulation of fat around important organs seems to make the general nutrition of low grade vitality, if it is not that the tendency to produce fat is in itself a manifestation of lowered vital resistance.

**Substandard Risks.**—It is easy to understand then that life insurance companies have had to create a class of substandard risks, that is, of lives on which insurance is granted only for definite terms under special conditions and at rates above the ordinary, according to the amount of extra risk involved. When individuals are 25 per cent. above the normal rate, the death-rate from all the causes described is prone to be high, and such cases can only be taken on the substandard basis. Practically all of the tendencies that are known to cause shortening of life, when existent in persons who have no absolute organic disease, come under the same classification.

**Occupation Hygiene.**—In recent years particularly, insurance companies have come to recognize that the moral hazard with regard to life insurance is more important than the added dangers of premature death because of conditions impairing vital resistance that may be found by medical examination. Individuals of immoral habits are proverbially short-lived, and the expression "they go the pace that kills" is literally exemplified by the statistics of life insurance companies. Gamblers, those engaged in the liquor business, and men who make their living by their wits are prone to be in frequent danger of excesses that eventually lead to shortlivedness. Even when bartenders do not use tobacco or liquor they are almost sure to be below the standard in actual expectation of life. Immorality has something to do with this, and the carelessness begotten of late hours, irregular living and the like are other important factors. In deciding the class of risk and the probability of its proving profitable for the company, physicians should take these considerations into account. The question that physicians have to answer with regard to the personal circumstances and the hygienic conditions of life of the patient refer to the moral hazard as well as to any physical risk that may seem to be present.

**Women in Life Insurance.**—According to the census, women on the average live to attain a higher age than men. This is what might be expected from the fact that they are not exposed to so many dangers, are not prone to so many excesses, are not exposed to unsuitable weather conditions. They would seem to be, therefore, eminently suitable risks for life insurance. The selected risks, those, namely, which had passed medical examiners, would seem to be especially likely to be profitable for insurance. Notwithstanding all these facts, the insurance of women has so far proved a constantly losing feature in life insurance. The main reason for this is that the moral hazard is greater in the insurance of women. The whole proposition must be looked at from the standpoint of financial risk. If many women applied for life insurance it would be different, but of the comparatively few who do apply, most are living under circumstances that makes the moral hazard much greater. Men, as a rule, do not consider that their wives should be insured, as they realize that it is the wives and not they who are the proper subjects of ben-

efit by life insurance. The main reason for the failure of the life insurance of women to be a profitable feature would seem to be that women much more frequently have an intuitive premonition of failing health than have men. They are more liable to malignant disease, which carries off so many victims in early middle life. Insurance companies have decided that the insurable interest in the case of women is not more than may be required to pay the expenses of the last illness and the funeral. Of course, where women are wage earners, or where they are active partners in business, there may be good reason for insurance, for the benefit of children or of partners. In these cases the insurable interest in a woman's life is quite as evident as in that of a man, and, taken on the whole, the insurance of such cases has not proven a money-losing departure for the insurance companies.

**Heart Disease in Substandard Risks.**—The existence of a slight heart lesion is the most frequent reason of classifying risks as substandard. Aortic heart disease, as the most frequent forerunner of sudden death, is not considered suitable for insurance, and is always rejected. A condition of mitral stenosis if of no great degree and if unassociated with mitral regurgitation, may be accepted, under special conditions. In the same way a slight amount of mitral regurgitation may be an acceptable risk, provided there has been no signs of any break in compensation at any time, no matter how long before the examination of the subject. The most important features with regard to the acceptability of slight heart cases as risks is the general condition of the applicant, his or her previous history and the question of weight. Any tendency to overweight is considered as a bad sign in those with any heart trouble and usually leads to their rejection.

**Dyspnea and Failing Compensation.**—If there has been at any time a tendency to dyspnea, that is, a marked shortness of breath in going up stairs, then a cardiac case is not acceptable as a life insurance risk. Further signs of dyspnea are incompatible with any prognosis of prolonged life. This is usually the first symptom of a break in the compensation, but other signs may be helpful in determining that the heart muscle has become incompetent for its work, marked tendencies to headache or a lessened amount of urine or nervous irritability of the heart when there is also an organic condition are all symptoms that forbid the assumption of the risk.

**Albuminuria.**—There are many patients suffering from albuminuria, who will live a score or more of years. Life insurance companies have been condemned, but without proper reason, for the rejection of such cases. The trouble is that medical science has so far furnished no distinction that gives any assurance as to the prognosis of cases in which albuminuria is present. The amount of albumin is not enough to decide this, and a trace of it may be the signal for a fatal termination within a few years, while a considerable amount is occasionally present, yet the sufferer may continue in life for a period long enough to make life insurance assumed on him profitable. Over and over again this has been demonstrated by the records of life insurance companies with regard to albuminuria, which have been very faithfully and completely kept in this matter for the twenty years. Many good authorities in clinical medicine are convinced that there exists a functional albuminuria dependent not on some lasting pathological lesion of the kidney, but on some passing condition either in the blood or in the renal secretory cells and without ultimate danger for the patient. Functional albuminuria is not easy to determine, however. More than once traces of albumin that have been attributed to functional albuminuria have proved eventually to be the preliminary signs of beginning Bright's disease, with fatal issue in from three to five years. Insurance companies have decided that unless certain conditions are all present in a case in which albuminuria occurs even intermittently, the risk will not be accepted. These conditions are those which have been found to occur in cases where careful following of the history has shown that the albuminuria continued for many years without any effect upon the general health.

**Conditions of Functional Albuminuria.**—First there must be no family history of Bright's disease. While Bright's disease is not in the strict sense of the word an hereditary affection, there is no doubt that cases of renal degeneration are prone to run in groups in individuals who are closely related to each other. There must be no renal symptoms, that is, the urine must be otherwise normal; there must be no tendency to pain, no irritating condition of the urine itself and no other abnormal constituents. Besides this, the patient must be under forty years of age, must have no bad habits and must never have suffered from any, even the slightest amount of dropsy. The aortic second sound must not be accentuated, and the blood pressure in the general arterial system must not be higher than normal. The specific gravity of the urine must not be below 1.010, and there must be some period within the day when the urine is entirely free from albumin. There must be no casts present as a rule. If the patient is otherwise healthy and the urine perfectly normal, a few hyalin casts may be present, without necessarily requiring the rejection of the case.

**Diabetes.**—Whenever there is any sugar in the urine the case is always to be considered as extremely doubtful. Insurance companies recognize, however, that alimentary glycosuria may occur, and that this does not necessarily mean the approaching death of the patient. If there is glycosuria and no other sign of diabetes, that is, if the patient is not thirsty, does not pass large quantities of urine, has not the tired feeling nor the tendency to cramps characteristic of diabetes, the case may be taken under consideration. A certain number of these cases are now accepted as substandard risks. There are no hard and fast rules for them, however, and each case must be judged by its individual merits. As a rule, cases in which sugar appears in the urine, except at the high tide of digestion, are to be considered as risks not worth accepting at any rates.

Dr. Charles Schramm, opening the discussion, said that it is interesting to realize that insurance companies have taken up this question of the insurance of substandard lives, and especially of accepting risks on patients suffering from slight amounts of valvular heart disease. There seems every reason to think that the statistics gathered under these circumstances by the companies will prove of great assistance in enabling medical men to make a more exact prognosis in these cases than it has been possible to make hitherto. There is no doubt that the companies will find such risks not so forbidding as they have been considered, since comparatively long life is by no means incompatible, as any practitioner of large experience in the cases of heart disease is sure to know.

**Medical Experts in Life Insurance Trials.**—Dr. Reynolds Wilcox said that his experience in the medical aspect of life insurance has consisted in opportunities for giving expert testimony in order to compel the payment of death claims. Dr. Wilcox is of the opinion that the medical examiners for life insurance companies are prone to reject many risks that would undoubtedly prove opportunities for profitable insurance. On the other hand, by a curious opposite anomaly of judgment, many cases suffering from affections sure to bring a premature end to life have succeeded in passing medical

examiners. Dr. Wilcox has seen individuals suffering from diabetes, from arterial degeneration, from severe nephritis, from pulmonary tuberculosis, with a cavity already present, secure policies which matured by death within a year or two. This failure on the part of medical examiners to recognize grave diseases is due to the fact that their examination is made by rule of thumb, by routine method without regard to individual cases.

**Insurance Companies' Directions.**—Some of the directions given to life insurance examiners by their Boards of Medical Examiners for the companies are difficult to understand. For instance, there seems to be a special insistence on the danger of tuberculosis after typhoid fever, which somehow is not borne out by the clincial experience of medical men who devote themselves more especially to the treatment of these affections. On the other hand, the time limit as to tuberculosis and its dangers in life insurance seems to be set too early. As a rule, it is presumed that if patients have not suffered from tuberculosis before middle life, they will not develop it afterward. Dr. Wilcox collected the statistics of some eight to ten thousand disabled soldiers in various soldiers' homes in the United States and found that in very many cases the origin of tuberculosis occurred at an age far above middle life, often after fifty, sometimes after sixty, and at times when, by the rules of most insurance companies, the danger from the development of the disease would be considered to be passed.

**Cancer in Life Insurance.**—Dr. William B. Coley said that insurance companies are wise in taking every precaution with regard to ruling out cancer cases. With regard to the family history of cancer, his experience has shown him that in most cases it is extremely difficult for even the surgeon in attendance at a case to obtain this without concealments. In a recent case Dr. Coley was brought in close relations with an interesting case, in which the insidiousness of cancer was well illustrated. A young business man took out a policy for $50,000, passing the medical examination without any difficulty. At the time of the examination he had a sore thumb, but as this was due to an injury acquired while letting down the office curtain, it was not considered important. During the healing of the wound the condition resembling that known as a run-around developed, and healing became very slow. During the healing process another pathological condition developed, which ultimately proved to be melanotic sarcoma. Amputation was performed, but to no avail, and the man died two years later of general sarcomatosis. The company refused to pay the policy, because the beginning of the fatal conditions were present when the risk was assumed, and had they been informed of their character they would have refused to issue the policy. The courts decided, however, that the applicant was in good faith, and so the policies had to be paid.

**Examiners' Failures.**—Dr. Follen Cabot said that examiners for life insurance companies are appointed and set to work very frequently without sufficient instruction. They are warned as a rule not to let little things disturb their judgment, and soon learn that the office prefers that a risk be reported either as good or bad. This requires definite decisions, often when such decisions are not easy to make. Regular examiners are paid a small salary, and yet the companies expect gilt-edged work. This is a very short-sighted policy, and is undoubtedly responsible for many of the failures of the medical department properly to eliminate risks, as they come in, and also accounts, at times, for the refusal of risks which would have proved paying investments for the company. Dr. Foote said that the slight amount of increase in premiums for the increase in age does not seem quite just. The expectation of life would seem to decrease with greater rapidity than the advance in premium.

**Albuminuria and Glycosuria.**—Dr. Ogden said that life insurance companies put too much weight on the presence of albumin in the urine, and lay not quite enough stress on the presence of sugar. Of course, when casts are present there is no question but that the risk should be rejected. Under middle age, however, slight amounts of albumin are often present in individuals who live to a good old age. On the other hand, intermittent glycosuria under middle age must be ruled out. It is before middle life especially that the presence of sugar in the urine is of significance. As a rule, it will not be long before the glycosuria takes on the malignant type, which characterizes diabetes in the second and third decade of life.

**Life Insurance Examination as a Test of Prognosis.**—Dr. James J. Walsh said that a recent interesting case of uncertain prognosis, in which the family doctor, in order to test his own knowledge, suggested that his patient should apply for life insurance, had recently come under his observation. At the age of about fifty years a prominent merchant in a rural town developed some dyspnea on exertion. As he had been gaining in weight, he did not consider this of great significance, but applied to his family physician for a tonic. His family physician found some signs of mitral trouble. Under the use of digitalis the murmuring sound completely disappeared, and the physician was not sure whether there had been anything more than a functional murmur existent for a time owing to over-exertion. He said nothing to his patient, but suggested that if he were not carrying much life insurance that this would be the time to apply for it, especially as the result of the examination would probably do away with any anxiety he might have about his health. The merchant had been approached by an agent several times previously and had been hesitating as to the question of life insurance. The next time the agent called he applied for a policy for $50,000. He was carefully examined by three physicians, who passed him, and he secured his policy. He died two and a half years later, with evident signs of severe mitral disease.

In closing the discussion, Dr. Knight said that for the acceptance of every substandard risk there is a discussion of five high officers of the company who are selected for this purpose. While it is the policy of every insurance company to pay all honest death claims, the treasurer's office being open for this purpose every day in the year, even holidays, it is easy to understand that life insurance companies could not be made to pay if they did not endeavor to do away with every possible loophole for fraud. His own company employed no salaried men as medical examiners, and paid full fees for each medical examination, and thought that this was the best method to follow. The medical examination does not after all count for so much in eliminating undesirable risks. In the low amounts of insurance no urinary examination, for instance, is required, and yet the death-rate from albuminuria is not high. Very few men suffering from glycosuria are accepted as risks. Out of 10,000 to 12,000 substandard policies issued by his company, not more than nine or ten are sufferers from glycosuria. Occasionally, of course, in spite of apparently every precaution, mistakes are made and bad risks assumed. In a recent celebrated case the man was insured for over $400,000, distributed in a number of companies. Just after an embezzlement he died suddenly, and it was thought that he had died from poisoning, self-administered, and as there was a suicidal waiver clause for the first year's insurance this would make the policies void. At autopsy, however, he proved on excellent evidence to have died of acute nephritis.

## CHICAGO SURGICAL SOCIETY.

*Regular Meeting, held June 1, 1903.*

The President, John B. Murphy, M.D., in the Chair.

**The Treatment of the Complications Attendant upon Chronic Gall-stone Disease.**—Dr. John B. Deaver, of Philadelphia, read this paper (by invitation). In acute obstruction of the common duct, operation is not to be thought of until increasing jaundice or a period of chronicity, with fever and rapid pulse, indicate the need of such interference. Chronic gall-stone obstruction, either with its increasing jaundice or the intermittent form, has called for surgical intervention, because of the liability of such stones to cause strictures, ulceration, fistulæ or damage to the pancreas and to aid in the production of suppuration of the liver ducts, when infection becomes superadded. As infection of a varying degree is practically always associated with the formation of gall-stones, and as such infection is surely accompanied by a catarrhal condition of the mucous membrane of the common duct, the presence of a calculus, even if not sufficient in size to produce jaundice, will impair the drainage of the duct, and induce a train of symptoms causing chronic invalidism.

The preparation for a gall-stone operation differs in nowise from that for any other, except in the presence of jaundice, when calcium chloride may be administered for three or four days previous to operation, in doses of 20 to 30 grains, three times a day. The use of a sand pillow is a useful adjunct in order to arch the spinal column and give a better exposure to the gall-bladder region. The author usually has it placed somewhat below the liver level, which is the point recommended by Mayo Robson, and places the table in a slight Trendelenburg position, three or four inches.

As to the incision, he fails to see any advantage in that made by Kehr; it is not only unnecessarily long, but by dividing two-thirds of the rectus muscle must certainly predispose toward hernia. The incision originated by Mayo Robson gives a perfectly satisfactory exposure of the field of operation, and by splitting the rectus muscle instead of dividing it, will insure a much stronger abdominal wall. After opening the peritoneum and inspecting the field of operation, the intestines are best kept out of the way by a few, well placed gauze pads, and over these several flat marine sponges. He uses the latter because, in spite of all precautions, some bile occasionally "spills" and the sponges soak up the fluid better and more quickly than gauze. In disposing the gauze and sponges, particular care must be given to the subhepatic space, and the region above and below the gastrohepatic omentum. The retention of purulent products in any of these fossæ may give rise to serious consequences later. He hardly believes that Kehr's method of performing hepatopexy by stitching the liver to the posterior parietal peritoneum is necessary.

The preparation of the field of operation calls for the expenditure of some time and attention to detail. He would no more think of cutting adhesions or searching for a stone without having protected the general peritoneal cavity than he would rupture a periappendiceal abscess in the absence of adequate gauze protection to the intestines. Adhesions should then be dealt with, and while in some cases a few ligatures and the use of the finger and scissors would be sufficient, in others the most extensive and careful dissections will be called for. Every band of adhesion should be carefully tied and divided, and in the separation of those of a more voluminous nature bleeding should be guarded against by the closest scrutiny. After freeing the adhesions, the gall-bladder becomes exposed and the right free border of the gastrohepatic omentum is traced to the duodenum. The gall-bladder holds the same relation to the common duct that the anterior longitudinal band does to the appendix, and the exposure of the gall-bladder and the free border of the omentum is the exposure of the field of the common duct.

A nice question may arise, to be decided when a dilated and displaced stomach due to pericholecystic adhesions has caused marked gastro-intestinal symptoms. The great advances and the brilliant results of a gastro-enterostomy may well cause an operator to pause and consider whether he can successfully break up all constricting bands and prevent their recurrence, whereas a gastro-enterostomy in addition may cause complete relief of the symptoms. Personally, he believes one should be governed by the circumstances of each case; the risk of opening the stomach and intestine is not absolutely *nil*, and the necessity of avoiding peristalsis for some hours after operation would perhaps cause extensive readherence of all raw surfaces.

Fistulæ require great caution in their management, in order to avoid soiling the peritoneum with bowel contents by inadvertently opening the intestine when cutting a supposed adhesion. These cases call for the expert use of the needle and thread, and require the operator to be the master of all situations and emergencies.

From a report up to 1897, which Dr. Murphy furnished to Mayo Robson, cholecystduodenostomy had been performed with the aid of the anastomosis button in 67 non-malignant cases, with only 3 deaths, these being due to continuous hemorrhage from laceration of the liver substance on the seventh day, to cholemia on the fourth day, and to septicemia on the fourth day, respectively. Of his 12 malignant cases, 10 died, giving a mortality of 83.3 per cent. It is important, before performing this operation, to observe whether the cystic duct is unobstructed, because if the gall-bladder is small, on account of loss of function, the operation is useless. Should the cystic duct be partially or completely obliterated, hepatic drainage is indicated, and when the gall-bladder is diseased its excision should be performed in addition.

The question of drainage occupies a prominent place in the technic of all gall-bladder operations. There is never any doubt in the mind of the operator as to the wisdom of draining the suppurative forms of cholecystitis and cholangitis. With a gall-stone partially obstructing the common duct and a shrunken, thickened gall-bladder, the most rational operation at first would seem to consist in removing the stone, closing the duct, and excising the gall-bladder. In addition to the tubular drainage, in such cases, he places two strips of gauze, one leading to the stump of the gall-bladder, the other slightly spread beneath the wound in the common duct. It is safer to drain the hepatic duct at all times, not only on account of infection, but owing to the likelihood of overlooking stones in the hepatic ducts. Kehr even goes so far as to state that after choledochotomy with suture, "even the most skilled surgeon must count upon overlooking stones in from 10 to 15 per cent. of his cases." The speaker uses a smaller-sized tube than the latter author when draining.

The question, When is the time of election for performing a surgical operation upon patients suffering with cholelithiasis, has been answered time and again by surgeons. Mayo Robson believes that "as soon as gall-stones give serious trouble, their removal by operation is the most rational method of treatment, since it is only from the complications, which in many cases of cholelithiasis arise sooner or later, that any danger after operation may be apprehended." It is the opinion of Dr. Deaver, after a rich experience in complicated and uncomplicated cases, that operation should be re-

sorted to as soon as it is definitely known that gall-stones are present. The recent statistics published by Kehr speak eloquently for the results of early operation. In 535 uncomplicated laparotomies for gall-stones, the mortality was 3.5 per cent. In 71 simultaneous operations in inoperable carcinoma of the gall-bladder, common duct or liver, in diffused suppurative cholangitis, diffused suppurated peritonitis and sepsis, the mortality was 97 per cent., nearly every case, 69 out of 71, succumbed to the deadly spread of infection or to carcinoma possibly the result of chronic gall-stone irritation. In 114 operations on the stomach, intestines, pancreas, liver, kidney, etc., 24 per cent. died. These cases were those in which extensive adhesions, chronic pancreatitis, or various changes in the liver and kidney made the operation difficult and the anesthesia prolonged. Gall-stones, *per se*, never kill, and fatal infectious cholangitis is not common in the absence of a stone in the ducts. It is only in the presence of great adhesions, fistulæ, suppuration, pancreatitis, or disease of the liver and kidneys that the mortality rises in direct proportion to the grade of the complication. Operation is particularly indicated in those cases of chronic calculous cholecystitis, without jaundice, and with or without enlargement of the gall-bladder. Like the interval operation in appendicitis, with a chronic low-grade inflammation, perhaps a fecal concretion, and with more or less adhesions, the removal of the diseased gall-bladder can be performed with as much celerity and safety as can the amputation of such an appendix. Unoperated, they give rise to a train of symptoms, driving the unfortunate patient to the stomach specialist, or to places like Carlsbad. The stones are too large to pass the cystic duct, and the low-grade inflammation is responsible for a sequel of symptoms which lead to chronic invalidism.

Dr. William J. Mayo, of Rochester, Minn., said there are two important questions in connection with surgery of the gall-bladder and biliary passages, which are as yet unsettled: (1) In what cases shall we remove the gall-bladder? (2) in what cases is it wise to drain the bile to the surface? The majority of the complications of gall-stone disease are the result of delay, and that preceding this time there are diagnostic symptoms which would have enabled an operation to have been performed with much less danger. Should we, in the early uncomplicated cases of gall-stone disease, take the gall-bladder out, or is it sufficient to drain it for a time, until the biliary discharge is sterile? Without going extensively into the physiology of the gall-bladder, there is no doubt but that Murphy is right in believing that one of its functions is to act as a tension bulb, keeping the flow of bile steady instead of intermittent. This is unimportant of itself, but when the gall-bladder is suddenly cut off by a stone impacted in the cystic duct, there are not only symptoms arising from the retention in the cystic cavity, but there is usually some irritation of the liver from the increased tension and mild infection, shown in many cases by transient slight jaundice, etc. The liver soon accommodates itself to this change, and when the acute symptoms of obstruction are over such a gall-bladder can be tied off without liver drainage, but if the cystic duct is not obstructed and the gall-bladder still persists in the biliary circulation, in spite of the stones, the sudden tying-off of the cystic duct, without provision for the escape of bile, is liable to increase liver tension and coincidentally the infection of the liver ducts, and adds this condition to the usual risks of operation. It is altogether probable that in the majority of cases this would do harm, yet in the exceptional ones cessation of liver function and death may follow. As stones do not re-form after complete removal and drainage, it would seem to the speaker that the excision of the otherwise healthy gall-bladder, on account of gall-stones, subjects the patient to some unnecessary risks, unless some provision is made for hepatic drainage. The thick, contracted gall-bladder, with obstruction at the cystic duct, has lost its function and such a gall-bladder is the one in which we are liable to have future trouble from mucous fistula, adhesions, cancer, etc. Fortunately, by reason of the obstruction, the liver has become accustomed to the change in the extension, and such a gall-bladder can be removed without biliary drainage. He has never seen harm follow the ligation of the cystic duct in such cases, and this exists in about one-third of the cases as they come to the operating table. Stones in the common duct are the cause of cholangitis, and drainage of bile to the surface is necessary either by a cholecystotomy, if the cystic duct is sufficiently patulous for the purpose, or by leaving the incision in the common duct open, the latter being the safer method. To what extent is it necessary to provide bile drainage in cases in which there are no stones in the common duct? Cholecystostomy drains the hepatic ducts by the escape of bile to the surface, and all of experience have seen a patient doing badly, suddenly relieved by a discharge of bile in a previously dry wound. So true is this that often with a patient not doing well the drains are loosened, hoping to establish bile drainage, and, if one succeeds, recovery usually follows.

He has tried to classify his cases with regard to the necessity of hepatic drainage. The following is about the position he has temporarily assumed as a result of this study: (1) If the gall-bladder contains bile and the organ is distensible, if the gall-bladder be removed, bile drainage is provided for by cutting the cystic duct across and leaving it open. If such a patient is very obese, or has degenerative lesions of other organs, he prefers cholecystostomy. (2) If there are symptoms of a cholangitis, even of mild grade, he provides for bile drainage, and if the condition is acute, the drainage must be free. (3) If the gall-bladder contains cystic fluid, but no bile, and the patient has symptoms of cholangitis, he removes the organ and cuts the cystic duct below the obstruction, to permit of bile discharge. If necessary, the cystic duct is split down to the common duct. (4) In a few cases he has directly opened the common duct for the purpose of securing liver drainage, but it is very rare that this is necessary, unless there are or have been stones in the common duct and it is dilated. The cystic duct ordinarily can be advantageously used for the purpose, although in a few instances he has found it necessary to cut it off flush with the common duct, leaving a lateral defect in its wall for drainage purposes.

This brings up the question as to how much danger of peritonitis there is as a result of bile leakage into the peritoneal cavity. If there is free gauze drainage with or without tubage, there is but little danger of peritoneal infection from the bile. He has never seen a case of death from this cause; but the drainage should be attached to the proper point by a catgut suture to prevent its floating away by the bile discharge or displacement by the action of the diaphragm upon the liver. If the common duct is greatly dilated and after removal of the calculi there is considerable detritus, the end of a rubber drainage tube is inserted just into the duct opening and secured by a catgut suture. If this condition does not exist, tubage of the common duct is unnecessary.

To sum up: Cholecystectomy is to be preferred if the patient is otherwise in good condition. If the cystic duct is obstructed and the gall-bladder contains only cystic fluid, ligation at the cystic duct, without provision for hepatic drainage, is safe. If there be any infection of the hepatic ducts, bile drainage is essential.

**Gall-stones and Gall-bladder Diseases from the**

**Standpoint of the Physician.**—Dr. Norman Bridge contributed a paper on this subject. He stated that the physician can often present the urgency of an operation to the patient better than the surgeon. Most people dread operations, and many suspect the surgeons of having undue enjoyment in the act of operating and of being biased by visions of large fees. The physician is, for these reasons, a more acceptable counselor, but even he, in these later days, says the essayist, is not free from the suspicion of seeking a part of the surgeon's reward. The author cited cases which vividly illustrate the long continuance of gall-bladder symptoms without recognition. Whether operation shall be done in all cases of proven gall-stones, or of suppuration or distention of the gall-bladder, is the same question over again of the misfortunes of the appendix. Cases become quiescent, or recover and remain so for years, even with gall-stones, the patients dying of other diseases or of old age. Hence one camp of doctors contends that in all such cases we should wait; not operate until forced to it by some urgent symptoms or situations. The other camp says that, for the sake of safety, operation should always be done promptly, since the next attack might be fatal. Both are in part right; neither can prove the other wholly wrong.

People are taking great personal risks in manifold ways all their lifes, and with the lightest thought. But if one suffering from cholelithiasis, to the extent of producing marked symptoms, would minimize to the lowest point his danger of death from it, he will probably have it dealt with surgically, always provided he has a surgeon who is wise in pathology and procedure, as well as expert in technic, and provided the patient has good vital organs. That statement is still true of the diseased appendix; it is true of gall-stones and gall-bladder infection as well. All cases of chronic cholelithiasis, where the suffering has led to the opium habit, should be operated. Every case of known distention of the gall-bladder by fluid of any sort is in constant peril, and should be operated, if possible. If there is reason to believe the bladder contains pus, operation is urgently demanded. And in all cases where frequent recurrences, or the persistence of symptoms indicate the progressive contraction and fibrosis of the gall-bladder, operation should be insisted on, for in these there is constant danger of an explosion of infection that may destroy life.

All cases of proven gall-stones or gall-bladder trouble are proper subjects for surgical consultation, whether they are to be regarded as surgical cases or ever come to operation. Whether operation is to be done or not, when conditions do not sound the insistent need of an operation, or the patient declines, or the physician sees reasons against an operation, proper medical treatment should be instituted always, and persistently carried out. This is as true of the gall-stone troubles as it is of those of the appendix.

What are such measures? In the acute cases, there should be absolute rest of the body. Rest of the stomach and bowels to the extent of starvation for some days is best, especially where peritonitis is present or threatened. Nutrient enemas may be allowed tentatively, but never nutrition by the stomach in such cases. The upper abdominal organs must be kept still, not be shaken about by persistaltic movements.

In the subacute and chronic cases the daily full flushing of the bowels by alkaline laxative waters is useful, but it is irrational to suppose that gall-stones are thus washed away. Nor do olive oil or any other of the pretended expulsive agents have the smallest effect. The thing that happens is probably merely the elimination of effete matter, thus increasing the physiologic resisting power. This process is aided by a restricted diet of the most assimilable foods, and by general good hygiene.

Dr. Frank Billings, speaking from the standpoint of the internist, said that given a reasonable certainty of the presence of gall-stones in the gall-bladder or ducts, it calls for their removal by means of the surgeon's knife, with the statement modified to this effect, namely, that where there exists some disease of other organs of the body, as the kidneys, or the heart, which would render the use of an anesthetic immediately dangerous to the health of the individual, it was questionable whether operation should be done. If gall-stones are acute in their manifestation, his advice is to wait until their symptoms have diminished or subsided. If attended with jaundice, to wait a reasonable time to see if it does not diminish, and if it does to attempt to improve the coagulability of the blood by the use of calcium chloride. In recent years, by means of calcium chloride, the coagulability of the blood has been increased or improved to such an extent as to make surgical operations less dangerous than before it was given. He would go further than Kehr, if he understood him correctly, and say that if there are symptoms of gall-stones in the common duct, and they subside, and if following that, within a reasonable length of time, there are further symptoms or indications of gall-stones, he would urge operation. He understood from the paper read by Kehr at Washington that he (Kehr) would not operate on such cases. While the speaker made this statement from a medical point of view, of operating on gall-stone cases when the evidence was clear that they were present, surgeons should not forget that they owe a great deal of what they know to-day to Pasteur and Koch. It is the work of Pasteur, Koch, Lister and others that has enabled surgeons to open the abdomen in these cases, and to treat them successfully. Dr. Billings then recounted briefly the symptoms of cholelithiasis and pointed out their peculiarities. He said the medical treatment of gall-stones was instituted long before surgeons opened the abdomen for the relief of this condition. The Carlsbad treatment has been in vogue for years, and surgeons should not censure medical men too much for sending their patients to Carlsbad or resorting to medical treatment, when it was known that a celebrated surgeon who, two years after operating on his own father for gall-stones, was attacked himself, but instead of undergoing an operation he went to Carlsbad for treatment.

Dr. Arthur Dean Bevan said that in a discussion as broad as the one on the subject of cholelithiasis, he took it that brief conclusions arrived at from a review of one's own experience would be in order, and with such an idea in view he submitted the following: (1) Gall-stone disease is due to a mycotic invasion of the bile tracts, and is exceedingly common. From my dissecting room experience, it occurs in 16 per cent. of such cadavers. (2) In the vast majority of cases of gall-stone disease, the patient does not suffer from the existence of the condition. (3) A close parallel cannot be drawn between cholelithiasis and appendicitis, and the conclusions which we have all arrived at in appendicitis, *i. e.*, that a diseased appendix should in practically all cases be operated on, cannot with equal force be applied to cholelithiasis: (*a*) Because the disease, in its first manifestations, does not carry with it nearly the amount of danger to the patient as does appendicitis; (*b*) because of the enormous number of individuals who have gall-stones many have slight, single or very infrequent manifestations of the disease, which are speedily recovered from, carry little danger, and a good prospect of permanent recovery. Several of his colleagues have had single attacks, and have been advised by both surgeons and internists to await developments and postpone operative interference until the indications warranted it. (4) As a corollary to the above, the hygienic

treatment, *i. e.*, exercise, diet, salines, is indicated in cholelithiasis, as a rule, in the first manifestations of the disease. (5) Surgical treatment is indicated when the manifestations of the disease are repeated, and especially when they are frequent and severe. Surgical treatment is demanded when we have (*a*) an infected gall-bladder; (*b*) with stone or obstruction of the cystic duct; (*c*) with stone or obstruction of common duct. (6) With stones still confined to the gall-bladder, cholecystotomy with drainage is the operation of choice. (7) With stone in the cystic duct, or obstruction of cystic duct, cholecystectomy is the operation of choice. (8) With stone in the common duct, choledochotomy with drainage is the operation of choice. (9) With stone in both cystic and common ducts, cholecystectomy and removal of stone from common duct, and drainage of common duct, is the operation of choice. (10) With obstruction of common duct from chronic interstitial pancreatitis or carcinoma, drainage of the bile tracts through the gall-bladder is the operation of choice. (11) In the cases of cholecystitis and cholangitis simulating gall-stones, drainage of the gall-bladder should be carried out, and with this probably the use of salicylate of sodium, which is excreted through the bile, and has seemed to exert a definite local antiseptic effect. (12) To expose the bile tracts, the incision which he introduced in 1898, as modified by Weir and Mayo Robson, gives the best access to the region, makes the operation in difficult cases much easier, saves valuable time, and is least likely to be followed by hernia. (13) The mortality from gall-stone operations is surprisingly small in uncomplicated cases. He had no deaths in more than one hundred cholecystotomies, and in more than 20 cholecystectomies had but one death in 14 cases of obstruction of the common duct. (14) The prospects of permanent cure after operative removal of gall-stones are very good. The recurrences of symptoms are almost always due to incomplete operations, *i.e.*, leaving some stones or the doing of a cholecystotomy where a cholecystectomy should have been done. (15) Personally, he had seen little evidence pointing to gall-stones as a factor in the production of carcinoma, and therefore inclines the belief that carcinoma favors gall-stone formation, and is the cause and not the effect where these two conditions co-exist. (16) The modern surgical treatment of cholelithiasis is, with the exception of the surgical treatment of appendicitis, the most valuable addition that has been made to medicine during the last twenty years. Inasmuch as the general practitioner sees most of these cases, in their early history, it rests with him whether or not this valuable knowledge will be made the most of and accomplish the greatest amount of good.

Dr. Deaver, in closing the discussion, said that the points brought out by Dr. Mayo relative to the non-removal of the gall-bladder in certain cases were very apropos. In the past he had made the mistake of tying off the cystic duct and removing the gall-bladder when he should have done a cholecystotomy. However, nature had come to the rescue, had forced the ligature off, established a biliary fistula, and had saved the patient's life.

The remarks of Dr. Bevan were in harmony with the position taken by most surgeons with regard to the treatment of cases of cholelithiasis.

A short time ago, in an address delivered in this city, the speaker said the surgeons of the East had to bow to the surgeons of the West, and after hearing the remarks of Dr. Billings, he was prompted to say that the medical men of the East would now have to bow to the medical men of the West. If the medical men of the East took the advanced position enunciated by Dr. Billings in regard to operative intervention in cases of gall-stones, it would not cause surgeons to have so many gray hairs, to spend so many restless nights, and to make them prematurely old.

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## SOCIETY OF ALUMNI OF BELLEVUE HOSPITAL.

*Meeting of June 3, 1903.*

The President, Robert T. Morris, M.D., in the Chair.

**Reportable Diseases.**—Dr. Hermann M. Biggs read a paper with this title with the object of eliciting some discussion as to the type of diseases which should be considered reportable. Within the last two years, he said, the Health Board had considerably increased the list of reportable diseases. At the present time this list comprised typhus fever, yellow fever, typhoid fever, scarlet fever, plague, cholera, measles, diphtheria, smallpox, chickenpox, whooping-cough, tuberculosis, malarial fever and contagious ophthalmia. In the case of malarial fever notification was required only from institutions, though private physicians were requested to notify such cases also. The speaker thought the time had arrived when a material change should be made in the attitude of the health authorities regarding reportable diseases, and that the list should be considerably increased and grouped somewhat differently. In his opinion, all the more important diseases which were infectious should be included in the class of notifiable diseases. Under the term, infectious, he would include all those caused by the simplest forms of life, and would rearrange their classification. The following tentative classification was then presented:

I. **Compulsory Notification.**—(*a*) Contagious diseases, *i.e.*, those which are very readily communicable, viz., measles, rubella, scarlet fever, smallpox, typhus fever and relapsing fever; (*b*) Communicable diseases, *i.e.*, diphtheria, typhoid fever, Asiatic cholera, tuberculosis of all organs, plague, tetanus, anthrax, glanders, epidemic cerebrospinal meningitis, leprosies, infectious diseases of the eye, puerperal septicemia, erysipelas and whooping-cough; (*c*) The indirectly communicable diseases, *i.e.*, communicable only through an intermediary host, viz., yellow fever and malaria.

In order to secure important information it was considered advisable to have reports on the following groups, notification to be compulsory only in the case of institutions:

II. **Non-Compulsory Notification.**—(*a*) Communicable diseases: Influenza, lobar pneumonia, bronchopneumonia, infectious diseases of the gastro-intestinal canal; (*b*) Parasitic diseases of the skin: Scabies, tinea tonsurans, impetigo and favus.

It was not intended that the Health Department should have surveillance over these diseases, but it was necessary to have information regarding them in order that they might be limited and controlled. For example, by such measures much valuable information could be obtained concerning malaria. It was well known that in large cities, particularly, there were many unnecessary cases of puerperal septicemia, and the notification of this disease would enable the health authorities to determine the causes, and would serve as a salutary restraint upon the abortionists. Pneumonia stood first as a cause of death in New York city, and yet the sanitary authorities had no adequate information as to the extent of this disease or as to its epidemiology. A new field of investigation had been recently opened in connection with the infectious character of summer diarrheas, and it seemed probable that some forms were much more easily preventable than would have been supposed from our previous knowledge. Investigation had shown that serious outbreaks of diarrhea and dysentery

had occurred in certain institutions and in certain areas which were in all probability preventable, and yet the sanitary authorities had no accurate and definite information regarding them. A serious objection that might be urged against the proposed plan was the largely increased labor that would be incurred by physicians. There were 35 diseases included in the list given. The English authorities paid a fee for each disease notified, and it might be possible to adopt that plan here, but this had not been the custom, and there were no funds at the disposal of the sanitary authorities for this purpose. The Health Department of New York city had endeavored to make some return to physicians for their labor in notification by aiding them in diagnosis by bacteriological examinations of certain classes of cases. This system must be admitted to have a certain monetary value, for, it should be remembered that the great mass of physicians were not prepared to make such examinations themselves, and the usual fee charged at the laboratories for such an examination was five dollars.

**Ophthalmia Neonatorum.**—Dr. J. H. Woodward said that there was no doubt in the minds of ophthalmologists that ophthalmia neonatorum should be a reportable disease, but whether the ophthalmias generally found in our schools should be included in this class was one open to much discussion, and without further thought he would not be willing to say that they should be notified.

Dr. W. J. Chandler said he desired to second all that Dr. Biggs had said, for he had felt for a long time that not only should these diseases be reported, but that *all* diseases should be reported to the sanitary authorities, for the accumulation of statistics and the obtaining of proper deductions therefrom. Some years ago the United States Government endeavored to collect such statistics from the local inspectors, but it was not pushed to any extent.

Dr. H. J. Boldt said he had been impressed with the paper so far as it treated of all septic infections of the puerperium. There had been such a law in Germany for a number of years, and he thought physicians as a class would look upon this proposition as very desirable. This would be especially so if the sanitary authorities took pains to see that midwives responsible for such infections were debarred from practising until the danger of spreading infection had passed. He recalled some years ago a small epidemic, with a number of fatalities, arising in the practice of one midwife. He hoped the proposed action would be taken at a very early date.

Dr. A. Brothers said that the Society was not only indebted to Dr. Biggs for this paper, but for much of the work of the Board of Health for many years past. The speaker said that years ago before taking up special work he had practised among the slums, and he knew very well what a great change had been wrought in these localities. The privilege of having exudates examined free of charge, the privilege of having material sent for inoculation, and even of having injections made by the Board of Health physicians all represented a great money value. With regard to the notification of many diseases, he would say that from the standpoint of the general practitioner it often happened that the physician was suspicious of the nature of a disease, and yet did not care to have the patient or his friends know more definitely about it at the time. This occurred more particularly in the early stages, especially in cases of tuberculosis. Most fair-minded physicians had overlooked this, but there were many physicians who felt that such regulations exposed them to much unfavorable and perhaps unfair criticism. From the standpoint of the obstetrician he could speak feelingly because he had been brought largely in contact with midwives, and from his recollection of this experience he foresaw much trouble arising in this connection; nevertheless Dr. Boldt was right in saying that the sanitary authorities should have information on such matters. The suspension of midwives from their work would not be sufficient to meet the difficulty; he had long claimed that the people who gave the midwives their privilege to work were the ones who were to blame. In this country there was no real system of education for midwives as was the case on the Continent. Some of the so-called midwives had had no training, but had borne several children themselves and had seen two or three other confinements. He had observed more mischief perhaps from the imported midwives because they "knew it all." Then there was the home product, a class of women who, after a very short course of instruction, received a diploma from a school, the instructors in which were physicians of no standing in the community. If the paper of this evening could bring about some remedy for this evil alone a very great advance in the control of puerperal infection would be made.

Dr. Floyd M. Crandall said that there could hardly be any doubt as to the importance of the reporting of infectious diseases and perhaps of all diseases for the purpose of tabulation and study. The great obstacle would be found in the objections of the general practitioner. One trouble was carelessness and forgetfulness in the matter of notification. Again, in many families a considerable pressure was brought to bear upon the physician to prevent the proper notification. A considerable time for education and training would be necessary before such a system could be made to work smoothly, and hence, the sooner the proposed plan was inaugurated, the better. He thought too much could not be said by the profession of this city with regard to the value of the work done in the health department by Dr. Biggs.

Dr. Louis A. di Zerega asked Dr. Biggs if he thought it was possible to report every case of typhoid within twenty-four hours after first seeing the case. He would also like to know the attitude of the Board of Health with regard to gonorrhea, syphilis and leprosy.

Dr. Gouley thought that all of the cases to which Dr. di Zerega had made reference could be reported by simply omitting the names, which were of comparatively little importance to the sanitary authorities.

Dr. Biggs, in closing the discussion, said he desired to bring about a different attitude on the part of the profession and people toward the health department and its work. The feeling was, and had been, that as long as any disease was reported to the health department, this notification became public property, and the health department assumed sanitary surveillance. The health department did not assume such surveillance except in the case of those diseases which were generally regarded as contagious or very readily communicable, such as measles, scarlet fever, smallpox, chickenpox and typhus fever. The reporting of chickenpox was required not because that disease in itself was an important one, but because a large percentage of the localized outbreaks of smallpox had, in the experience of the health department, come from unrecognized and very mild cases of smallpox which had been regarded as chickenpox. For that reason the department required that every case of chickenpox occurring in the adult be seen by a diagnostician of the department. Although last year about 15,000 cases of pulmonary tuberculosis were reported to the health department, it was found still that many practitioners had a strong feeling against the reporting of such cases. However,

the same men who would decline to report a case of tuberculosis as such would send a specimen of the expectoration for examination by the department. This attitude evidently indicated the fear that the health department would make such notification public property, and would assume sanitary surveillance. The department had never done this except in tenement and lodging houses, and did not even then make inspections or take any action, if the physician reporting it was a private physician, and did not desire the health department to take any such action. With regard to pneumonia, influenza and the diarrheal diseases, he would say that the object of notification was not that the health department desired in any way to embarass the physician but rather to assist in determining what unsanitary conditions had existed, and had been potent in the production of these diseases. He knew very well that from time to time there was ground for the feeling of antagonism between the private physicians and the health department, but it was impossible with a corps of three or four hundred inspectors furnished to the department by the civil service board to have everything working satisfactorily. These persons could not be removed from office by the department except for very good and definite cause. If improper conduct on the part of the inspectors were promptly reported to the sanitary authorities the matter could be easily corrected, but instead of this it was the rule for the profession generally to nurse their wrongs rather than forward the particulars of their complaint to the proper authorities. Within a little over a year 35 inspectors had been dropped because of their making false returns of their work. The same thing was true to a large extent with regard to the foreign element of the tenement house population. He had the feeling that if the list of diseases presented by him were very much increased the attitude of the people toward the health department might be changed because of a better knowledge of the true functions of that department. To the old list of diseases in which notification was compulsory had been added only glanders, epidemic cerebrospinal meningitis, puerperal septicemia and erysipelas. At the present time more than 80 per cent. of all the cases of pulmonary tuberculosis occurring in the Borough of Manhattan were reported. The notification of venereal diseases had received very careful consideration. He saw no objection to the reporting of such diseases without names, yet a pretty large experience had taught him that there was little to be gained. Physicians were too busy to attend to such work unless there was some spur, such as would arise from tracing these reports. Again, he had been a little at a loss to know what the sanitary authorities would do even if these cases were reported, and some person who had contracted a disease of this kind should come to the health department and ask why he had not been protected from this known source of infection. The question had been asked with regard to the notification of typhoid fever; he would answer that the law specified that notification should be made twenty-four hours after the *recognition* of the disease, for, of course, it could not be reported before it had been recognized. The reporting of cases did not involve any notoriety, for the records of the department were not open to the public except so far as concerned the contagious or very readily communicable class of diseases. Cases of leprosy had been reported to the department, and they had been at a loss to know what action to take. It was not desired to keep such persons on North Brother Island for the rest of their lives, as there were no recorded cases in which this disease had been spread here by contagion. Numerous attempts had been made to secure legislation for the regulation of midwives; at the present time nothing was required to become a midwife further than a statement, signed by two physicians, that she was competent. He believed if puerperal septicemia were made a reportable disease, and the responsibility for the large number of such cases be fixed upon the midwives, it would be possible to obtain legislation for their control.

Probably no one had any conception of the prevalence of trachoma in the public schools before the crusade made last year by the health department. Since the first of the present year a "tracboma dispensary" had been established with a staff of 17 physicians. Two of these operated in the morning, and two in the afternoon, and an average of 25 operations for trachoma, under anesthesia, were done daily. In addition to this work, between three and four thousand other eye cases had been treated each week.

With regard to the work on diphtheria in the tenements, the speaker said that about 50 new cases of diphtheria a week were treated in the tenements by the Board of Health physicians. These cases were usually neglected and severe ones, yet the mortality among these cases in the past year had been a little over 7 per cent. This gave some idea of what antitoxin had done in the control of diphtheria.

## AMERICAN PROCTOLOGIC SOCIETY.

*Fifth Annual Meeting, held in St. Charles Hotel, New Orleans, May 5 and 6, 1903.*

The President, Samuel T. Earle, M. D., in the Chair.

**"The Qualifications for Membership in the American Proctologic Society."**—The President delivered a very able address on this subject. Among other things, he said:

"Now is the time that our foundation is being laid, and the life and success of the Association depend upon the wisdom and discretion with which it is laid. We should look well to how our ship of state is trimmed and manned for each year's voyage, and have our course well mapped out to avoid the possible rocks and quicksands. And just at this time and juncture it seems to me that our attention should be called to a matter of the gravest importance to the continued life and usefulness of our Association, if it is to be the oracle of thought, purpose and action in all that pertains to proctologic work. The profession, and especially general surgery, is looking askant upon us, and is already prophesying that no great good can be accomplished in such a restricted field, and where work to be done is so near the surface, and within reach of the simplest observer. It is certainly expected that if we are to be recognized as leaders in this line of work, we must use as our foundation the cardinal principles that underlie both general surgery and medicine; in other words, we must be well grounded in the principles of both. In the organization of any association, it is almost impossible to draw the lines very tight; but when fairly upon its feet, there is nothing more important to its perpetuity and usefulness than the character and ability of the members it gathers in, and upon whom the position to be taken by the association depends. We cannot scan too closely, or from too many standpoints, those whom we delegate to carry on this work, and on whom its future success depends. It is quality, not numbers, that we most need; neither the one whose usefulness in proctologic work is interfered with by his interest in other departments of medicine or surgery, nor the pseudo-proctologist, should apply for member-

ship in this Association. The principal object the members of this Association have had, in keeping it a separate and distinct organization from the American Medical Association, has been that we might control the character of its membership, not from any selfish or narrow motives, as is evidenced by the welcome we have always accorded to those who are not members, to attend our general meetings, but for the broad and worthy object of enrolling upon our list of members only men of ability, learning, and with the avowed purpose of bending all their energies to advancing their knowledge of rectal medicine and surgery; because it is only by such means and men that we can hope to maintain our position as leaders and directors in this special line of work. Candidates for admission to the American Proctologic Association should be specialists in that line of work, meaning thereby that they devote their energies chiefly to it. I do not mean to say that we may not often get valuable suggestions from those in other lines of work, just as general medicine and surgery do from kindred sciences. If men in the various specialties of medicine would only be sufficiently honest and unselfish as to confine themselves strictly to their special work, there would be no necessity for the suggestions I am now making. We would have no such applicants. Show me a gynecologist or general surgeon who would hesitate for one moment to take a case of rectal surgery. I do not mean to say that our work is so complicated that others than rectal surgeons cannot perform such operations. A general surgeon can perform iridectomy, but who would be so foolhardy as to go to a general surgeon for such an operation when a competent oculist is at hand? So it is in ours, and in all other specialties: the man who confines himself to one line of work must be far below mediocrity if he cannot perform the operations in his line better than the general surgeon, or those in other special lines of work. In order to be recognized by this organization, one should be something more than a mere itinerant vendor of a pile ointment, or a pile doctor whose only armamentarium consists of a hypodermic syringe and a bottle of carbolic acid. We need well-educated, well-trained, and well-equipped men to carry on this work. We have submitted to us operations that require the most perfect surgical technic and the greatest skill, the coolest head and deftest hand."

**X-Ray Therapy in Ano-Rectal Diseases.**—Dr. J. Rawson Pennington presented this paper. The author dwelt upon the importance and efficiency of this agent in the treatment of pruritus ani, where the cause is local. The Society asked Dr. Pennington to continue his searches in X-ray therapy in rectal diseases.

**Tuberculous Ulceration of the Rectum and Anus.**—Dr. L. H. Adler, of Philadelphia, presented a paper upon this subject, in which he stated that tuberculosis is now recognized as the cause of a number of conditions occurring about the anus and within the rectum, the pathology of which was formerly obscure. The disease may be a primary process, but in the majority of instances it is secondary to similar changes in other organs. It may involve any portion of the rectum, or the skin about the same; its most frequent site, in the author's experience, however, is at the muco-cutaneous junction. The affection is always due to the tubercle bacillus. Any plan of treatment, to be of benefit, must, in a large measure, be directed to the general constitutional condition; and for this purpose, pure air, forced feeding, and all the hygienic and medicinal measures should be adopted as are employed in general tuberculosis. The local treatment has for its main objects the destruction of the tubercle bacilli, and the establishment of a healthy reparative process. The Paquelin or the galvanocautery, chemical caustics—such as chloride of zinc, nitric acid and acid nitrate of mercury—the curette, and the X-ray, have been employed for these purposes, and with varying results.

**Primary Tuberculosis of the Rectum with Report of Cases.**—Dr. Leon Straus, of St. Louis, presented this very interesting paper.

**Atony of the Rectum and Anal Sphincters; its Etiology, Pathology, Diagnosis and Treatment,** was the title of a paper presented by Dr. William Bodenhamer, of New York, in which he said: "Atony of the rectum and colon is most commonly met with in delicate women of a lax muscular fiber, and in those whose sedentary occupations lead to a neglect of the necessary measures to insure the regularity of the functions of the organ. It is also frequently met with in delicate children. In the treatment of rectal atony, the first consideration is to enjoin a strict observance of regular habits respecting a daily evacuation of the rectum, and this may be aided and often attained by simple means, such as the injection of half a pint of cold water into the rectum at the regular time of going to stool; cold being tonic, stimulant, and astringent, and acts somewhat similarly to nux vomica, by exciting the sensibility and contractility of the organ; but it should be discontinued as soon as the object of its use has been attained. In the more obstinate cases, however, the chief remedies should be nux vomica, alone or combined with some other ingredients, together with the employment of rectal injections composed of powerful astringents and tonic substances, with the intention of inducing contraction, corrugation, and condensation of the relaxed and weak muscular fibers of the rectum, by which they become shorter and firmer, and thus aid in diminishing the morbid organ to its normal dimensions and tone."

**Obstipation, its Causes, Effects, Diagnosis and Treatment.**—This interesting paper was read by Dr. John L. Jelks, of Memphis, Tenn. He stated that obstipation is the term used by proctologists to denote mechanical obstruction of the bowel, and is preferred to the generic term of which obstipation is one variety. He classed the causative factors as follows: (1) Extravisceral, (2) perivisceral, (3) visceral, (4) intravisceral. One of the chief facts which the author wished to forcibly express is that other factors may and do cause obstipation or obstructive constipation, and a careful discrimination should be made before an operation is performed upon a supposed obstructing rectal valve.

**Cautero-angiotribe.**—Dr. B. Merrill Ricketts, of Cincinnati, called the attention of the Society to this instrument as an efficient agent in the treatment of hemorrhoids and first degree rectal prolapse. This subject, together with that of "Hemorrhoids," by Dr. George T. Cooke, of Indianapolis, elicited considerable discussion, and Dr. Ricketts was instructed to make further report on the use of the angiotribe in the treatment of hemorrhoids. The discussion disclosed the approval of various methods of treatment of hemorrhoids, but none of them ideal.

**The Treatment of Anal and Rectal Diseases without General Anesthesia,** was the title of a paper by Dr. William L. Dickinson, of Saginaw, Mich., in which he said: "The treatment of anal and rectal diseases has been so long associated with that of general anesthesia that when a patient presents himself, and we have made an examination, we unconsciously begin to solve the mental problem of how he will take the anesthetic, and the number of days he will be confined to the house after the operation. The time-honored treatment of anal fissure by dilation, under chloroform, was both effective and speedy; but we can accomplish the same results, in a little longer time, by the use of cocaine or eucaine. Superficial fistula, ischiorectal abscess, ex-

ternal hemorrhoids, and many cases of internal hemorrhoids, can be operated upon under filtration just as well as general anesthesia. We owe it to our patients, and also to ourselves, to keep patients from going to the irregular practitioner, for as regular, educated physicians, we ought to be able to cope with all diseases of the rectum, in an intelligent manner, and thus give entire satisfaction to our patients. Our students should be taught that the greater number of our patients seek our advice and aid for ailments that respond readily to office treatment that can be given without general anesthesia.

**Molluscum Fibrosum of the Rectum in a Patient, the Subject of the Typical Skin Lesion—A Unique Case.**—This paper was reported by Dr. A. Bennett Cooke, of Nashville. This was probably the most interesting paper of the meeting. He stated that the feature of the case which justifies the adjective "Unique" is not the skin disease nor the occurrence of the multiple fibroid tumor in the rectum, but rather the association of the two conditions in the same individual and the further fact that the mucous and cutaneous tumors are identical in structure. He described the patient as emaciated, sallow, nervous and despondent; at least a dozen calls to the stool in twenty-four hours; sphincters relaxed and peri-anal integument excoriated from the irritating discharges; anal canal patulous, in spite of numerous successive abrasions. The proctoscope revealed the rectum almost completely filled with polypoid tumors, many of them ulcerated and bathed in a mucopurulent, blood-stained secretion of exceedingly offensive odor. The growths began in the lowest rectal chamber, varying in size from a bird shot to an almond; the largest were uniformly pedunculated, those intermediate in size had sessile attachments, and the smallest appeared as mere elevations under the mucous membrane, well embedded. It was found that the lesions extended well into the sigmoid colon, smaller in size, and were attended by less inflammation of the mucosa. Beginning below, the tumors were removed by tortion with the forceps, and by biting them off with a curette against the sharp end of the proctoscope. The hemorrhoid was rather free, so that it was possible to remove only a small number at a sitting. The operation was repeated from time to time during a period of three weeks, when the bowel, as high as could be seen, was clear of all but the smallest tumors. Sixty of the growths were removed; no anesthetic was employed. Dr. Cooke appended a report from a pathologist, which demonstrated the identity of the skin and rectal lesions. The production was considered a valuable contribution to proctologic literature.

The Society elected the following officers for the ensuing year: President, Dr. William M. Beach, of Pittsburg; Vice-President, Dr. Leon Strauss, of St. Louis; Secretary-Treasurer, Dr. A. Bennett Cooke, of Nashville. Executive Council: Dr. Samuel T. Earle, of Baltimore (retiring President), Chairman; Dr. George B. Evans, Dayton, O., and Dr. John L. Jelks, Memphis, Tenn.

The Society adjourned to meet in Atlantic City, in June, 1904, on the first and second days of the meeting of the American Medical Association.

## BOOK REVIEWS.

Tuberculosis. By Norman Bridge, A.M., M.D., Emeritus Professor of Medicine in Rush Medical College. W. B. Saunders & Company, Philadelphia, New York and London.

Dr. Bridge's book is recast from lectures delivered at Rush Medical College, Chicago, and is a worthy contribution to our American observations on tuberculosis, besides being thoroughly representative of our practical methods of diagnosis and treatment of the disease.

One phase of the extremely practical way Dr. Bridge has of looking at details of treatment of tuberculosis can be appreciated very well from a quotation from his chapter on Sanatoria for Consumptives. "If every person," he says, "with pulmonary tuberculosis, could, from the very first, give up and not pretend to himself or to others that he is well, but settle down with patience and attention to the business of getting well, the proportion of recoveries would be greatly increased. The sanatorium life is conducive in a high degree to this good philosophy. It is attainable at home, but less easily. There the temptation to do all sorts of things, often begets an attempt to hide even the existence of tuberculosis, as though it were a disgrace like drunkenness or opium taking, to be spoken of only in an undertone and even forgotten by the patient." This places the modern theory of the treatment of tuberculosis in sanatoria in a better light and truer than any statement we have yet seen.

It is not so much the air or even the diet of the sanatorium as the regularity of life and the admission that all are taking care of themselves because of deadly disease that counts for health.

Surgical Diseases of the Kidney and Ureter. Including Injuries, Malformations and Misplacements. By Henry Morris, M.A., M.B., Lond., F.R.C.S., Fellow and Chairman of the Court of Examiners of the Royal College of Surgeons, etc. W. T. Keener & Co., Chicago.

These two volumes come very near to the ideal in the completeness with which they cover an entire province of surgery, and in the masterly manner in which the subject is handled. Twenty years ago, when the author published his "Manual on the Surgical Diseases of the Kidney," he was a pioneer in what was almost a new field, and there was great difficulty in obtaining information, owing to the scantiness of material published, but the two following decades have been marked by the utmost activity in this department of surgery, and it now requires a master hand to set in order the voluminous literature which has accumulated since the first nephrolithotomy was done in 1880. The development of the surgery of the ureter is of still more recent growth, since, prior to 1894 the number of papers on this subject might be counted on the fingers of one hand, while now they run up into the hundreds. The author has done a work of inestimable value in digesting this mass of information scattered through the literature of the world and presenting what it contains of value, illuminated by his own vast experience. With a work of such scope a detailed review is scarcely possible and a general indication of the plan of the book must suffice. Volume I. is devoted entirely to the kidney and contains 21 chapters considering the normal and pathological gross anatomy of the organ, its clinical examination, movable and floating kidney, injuries and tumors of the kidney, perinephritic extravasations and inflammations, suppurative and non-suppurative pyelophlebitis, renal and circumrenal fistula, and tuberculosis and syphilis of the kidney.

The first portion of Volume II is given up to renal calculi and minute descriptions of the technic of the various operations on the organ. In Part Two the ureter is discussed and its anatomy, injuries, inflammations, strictures, tumors, fistulæ, calculi, etc., described in 20 additional chapters, together with the technic of its catheterization and operation upon it. The former is a procedure the author strongly condemns as a routine diagnostic measure, as well as for the purpose of

treating hydro- and pyonephrosis and ureteral stenosis, owing to the unreliableness of the information it affords, the risks to which it exposes the patient, and the difficulties of execution attending it. The use of Harris' and the other newer vesical segregators does not seem to be mentioned, nor is the value of cryoscopy in determining the functional efficiency of the "other kidney" indicated. We have also been unable to discover any mention of decortication of the kidney for chronic nephritis.

The illustrations are nearly all original, and for the most part portray pathological specimens.

The Surgical Diseases of the Genito-Urinary Organs. By E. L. Keyes, A.M., M.D., LL.D., Consulting Surgeon to the Bellevue and Skin and Cancer Hospitals, and E. L. Keyes, Jr., A.B., M.D., Ph.D., Lecturer on Genito-Urinary Surgery, New York Polyclinic Medical School and Hospital. A Revision of Van Buren and Keyes' Text-book. Appleton & Co., New York and London.

This, the second complete revision of what was the first book in any language in which genito-urinary diseases and syphilis were grouped together brings the volume once more to the pre-eminent position it had so long occupied. In accordance with modern views, syphilis, which is a genital disease only in its commonest method of invasion, has been entirely eliminated, while the anatomical method of classification formerly adopted has been abandoned in favor of the more logical clinical system of to-day. Venereal diseases, as such, having been excluded, sexual and genital maladies have been relegated to second place and somewhat subordinated to the consideration of diseases of the urinary tract. Gonorrhea, however, is considered at great length and its complications in joints, the eye, etc., are treated with unusual completeness. We accordingly find that the first 650 pages are devoted to diseases of the urinary organs, including gonorrhea, while the diseases of the genital organs per se occupy the remainder of the book.

In their treatment of specific urethritis the authors rank themselves with the advocates of the irrigation method and employ the modified Janet technic suggested by Chetwood. Ureteral catheterization they consider still sub judice, but the descriptions of the technic of cystoscopy and the interpretations of its results are excellent and accompanied by a good plate portraying typical cystoscopic pictures. The Bottini operation is admitted to be a step in the right direction in the treatment of prostatic hypertrophy, but is open to the objection of being done in the dark and of invading a septic cavity without providing drainage. The preference is accordingly given to Chetwood's perineal galvano-prostatotomy, which is practically a Bottini operation done through a perineal section wound. This is considered the simplest and safest operation yet devised for the cure of prostatic hypertrophy, though for the larger glands it may have to be supplemented by suprapubic or perineal prostatectomy.

The work throughout bears the stamp of wide experience and thoughtful consideration of the literature and affords a thoroughly reliable and instructive guide for the practitioner and student. Even though an occasional statement, such as the remark that in performing suprapubic aspiration of the bladder "it is not necessary that the surgeon's hands be surgically clean," and the advocacy of the subcutaneous ligature of varicocele does not altogether harmonize with the views of the general surgeon, the book no doubt remains the most valuable and authoritative work on the subject in the language and will enjoy the distinction, rare in medical literature, of having guided the thought and practice of three generations of medical men.

## BOOKS RECEIVED.

*The* Medical News *acknowledges the receipt of the following new publications. Reviews of those possessing special interest for the readers of the* Medical News *will shortly appear.*

Felix. A Novel. By R. S. Hichens. 8vo, 431 pages. F. A. Stokes Co., New York.

Autobiography of a Thief. By H. Hapgood. Octavo. Fox, Duffield & Co., New York.

Protozoa and Disease. By Dr. J. J. Clarke. 8vo, 177 pages. Illustrated. Wm. Wood & Co., New York.

Gynæcology. By Dr. W. R. Pryor. 8vo, 380 pages. Illustrated. D. Appleton & Co., New York and London.

A Treatise on the Care of the Expectant Mother. By Dr. L. Howe. 12mo, 63 pages. F. A. Davis Co., Philadelphia.

Tumors, Innocent and Malignant. By Dr. J. Bland Sutton. 8vo, 556 pages. Illustrated. W. T. Keener & Co., Chicago.

Surgical Diseases of the Abdomen. By Dr. Richard Douglas. 283 pages. Illustrated. P. Blakiston's Son & Co., Philadelphia.

Post-Mortem Pathology. By Dr. W. H. Cattell. 8vo, 372 pages. Illustrated. J. B. Lippincott Co., Philadelphia and London.

Uric Acid in the Causation of Disease. By Dr. A. Haig. Sixth edition. 8vo, 947 pages. P. Blakiston's Son & Co., Philadelphia.

Diseases and Injuries of the Eye. By Dr. Arnold Lawson. Sixth edition. 8vo, 587 pages. Illustrated. Smith, Elder & Co., London.

International Clinics. Volume I. Thirteenth Series. 1903. Octavo, 306 pages. Illustrated. J. B. Lippincott Co., Philadelphia.

Organic Nervous Diseases. By Dr. M. Allen Starr. Octavo. 8vo, 751 pages. Illustrated. Lea Brothers & Co., New York and Philadelphia.

The Praxis of Urinary Analysis. By Dr. Lassar-Cohn. Translated by Dr. H. W. F. Lorenz. 12mo, 58 pages. John Wylie & Sons, New York.

Reference Handbook of the Medical Sciences. Edited by Dr. A. H. Buck. Volume I. Quarto. 1,004 pages. Illustrated. Wm. Wood & Co., New York.

Syphonage and Hydraulic Pressure in the Large Intestine. By Dr. R. W. Leftwich. 12mo, 80 pages. Illustrated. William Wood & Co., New York.

A Manual of Surgical Treatment. By Drs. W. W. Cheyne and F. F. Burghard. Vol. VII. 8vo, 559 pages. Illustrated. Lea Brothers & Co., New York and Philadelphia.

Modern Materia Medica and Therapeutics. By Dr. A. A. Stevens. Third edition. 8vo, 663 pages. W. B. Saunders & Company, New York, Philadelphia and London.

A Surgical Treatment of Gastric and Duodenal Ulcers. By Dr. B. G. A. Moynihan. 8vo, 82 pages. Illustrated. W. B. Saunders & Company, New York, Philadelphia and London.

A Practical Application of the Röntgen Rays in Therapeutics and Diagnosis. By Drs. W. A. Pusey and E. W. Caldwell. 8vo, 591 pages. Illustrated. W. B. Saunders & Company, New York, Philadelphia and London.

Physiological Aspects of the Liquor Problem. Investigations made and under the direction of W. O. Atwater, J. S. Billings, H. P. Bowditch, R. H. Chittenden. Two volumes. Octavo. Houghton, Mifflin & Co., Boston and New York.

# THE MEDICAL NEWS.

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## ORIGINAL ARTICLES.

### ACUTE NON-SUPPURATIVE ENCEPHALITIS: WITH REPORT OF A CASE.

BY HARLOW BROOKS, M.D.,

OF NEW YORK;

ASSISTANT PROFESSOR OF PATHOLOGY IN THE UNIVERSITY AND BELLEVUE HOSPITAL MEDICAL COLLEGE; CURATOR TO BELLEVUE HOSPITAL; PATHOLOGIST TO MONTEFIORE AND HARLEM HOSPITALS.

CASES of acute non-suppurative encephalitis are not commonly reported in medical literature. Strümpell well states it is an exceptional disease and that our information concerning it is scanty. For this reason I believe that the following observations are noteworthy since they introduce what appears to be a most typical example of this condition.

Personally I am not inclined to think the disease so rare as generally believed, and, I think, that we may safely paraphrase Strümpell's statement and more certainly say that the disease is exceptionally recognized, largely due to the fact that our information concerning it is scanty.

The symptomatology of the condition is so similar to that of many other diseases that doubtless clinical cases are not infrequently recorded as of other forms of disease. Furthermore, the gross lesions may be so slight as to throw no further light on the case, even after post mortem examination, as in the instance I am about to present. Microscopical examination, in at least a considerable number of instances is the only possible method for its certain detection, and it is necessary that these studies be thorough in order that the condition be definitely recognized.

It is generally admitted that a considerable number of cases recover, either wholly or partly, depending on the extent and the location of the lesions. Probably then, the disease is much more frequent than generally supposed, and that its reported rarity is partly due to the great difficulty of differential diagnosis and because most of the cases fall naturally into the care of the more or less sceptical practitioner, who, unless the case terminate fatally ascribes it most likely to "hysteria," or because in the fatal cases the post mortem investigations are not sufficiently thorough to clearly identify the condition.

It appears to me that one of our most serious errors in the consideration of the disease lies in our very narrow conception of its etiology. Why should we not accept as an etiological factor every agent which is able to set up inflammatory processes in other parts of the body, as in the liver or kidney? Considering the brain in the same broad pathological sense as we do these more fully understood organs, we may consistently enlarge the generally accepted etiology to include nearly all inflammatory excitors. Of such, toxic agents are doubtless the most frequent. Among the toxins we must include many chemical poisons, of which alcohol is doubtless the most frequent, metabolic poisons and those toxins produced by the growth or action of bacteria. To these agents may also be added the inflammation following traumatism. There is no reason why all these factors should not enter into the production of inflammation of the brain, as they do in inflammatory diseases of other parts of the body. Modern pathology cannot tolerate the narrow and entirely fantastic idea that inflammatory processes are always produced by bacteria or their products, and yet I find this absurd theory stated to be the only possible explanation for acute cerebritis, in the articles of men, writing but a few years ago, who certainly should have known better.

The lesions of acute non-suppurative cerebritis may be considered in the same broad light and will be found to be of the same general character as those of inflammatory disease elsewhere, remembering, of course, the special histological characteristics of the cerebral tissues. Bearing this in mind, it is quite unnecessary that we subclassify non-suppurative encephalitis as hemorrhagic or not, for as in all inflammatory disease, whether hemorrhage takes place or not, depends entirely on the degree of the process and to a certain extent on the location of the lesions. Probably the reason that the hemorrhagic stage is relatively much more frequently reported is that hemorrhagic extravasation takes place in the advanced cases where diagnosis is more certain and death more likely to occur, while the post mortem lesions are of so striking a character as to be clearly evident to the most casual observer. Where extravasation does not take place, diagnosis is more difficult, and complete or partial recovery is probably the rule, while the gross lesions are of so minute a character as to escape all except the most careful investigations. I have demonstrated this to be the case in two instances of the acute non-suppurative cerebritis of acute alcoholism.

Acute encephalitis may terminate in death if the disease involves part of the encephalon the perfect function of which is essential to life. The process may extend to the pons, cerebellum and to the medulla.

Complete recovery may take place if the cause of the process disappear or exhaust itself, and if the lesions already produced be not too extensive or situated in vital centers. In such cases more or less complete absorption of the inflammatory exudate probably takes place. This is of course less frequent where hemorrhagic extravasations have taken place.

On the other hand partial absorption only, may

take place and cicatrices of hyperplastic neuroglia mark the sites of the old inflammatory foci, with the result of more or less disability of the function of the involved portions of the brain. In these cases a picture somewhat resembling that of disseminated sclerosis may follow. Such conditions are not at all uncommon in chronic alcoholics, or after severe cases of insolation, as stated by Collins.

It has seemed wise to me to consider the disease in this very general way, hoping that I might thereby attract more attention to the fact that the pathology of acute non-suppurative encephalitis is identical to similar processes affecting other organs. For a detailed account of the minute changes the readers are referred to the many excellent articles on the subject and to the lesions well typified in the following case which I now wish to present.

*History.**—The patient was admitted to St. Vincent's Hospital, on Oct. 19, 1902. The history is as follows: Female, aged nineteen years; domestic. She has been a heavy tea drinker, otherwise negative as far as can be ascertained; family history is negative. Her previous history was obtained at her place of employment. The patient had been subject to headaches for a considerable length of time, also to "bilious" attacks, some of which came on at the time of the monthly sickness. She had such an attack preceding present illness by a day or so. She was rather dull mentally.

On the night previous to her entrance to the hospital, she was apparently as well as usual. She did not appear at her usual hour on the next morning, and was found in her room in an unconscious condition. A physician was summoned but he was unable to arouse her. The patient had been accustomed to dose herself with antikamnia to control her headaches, and a box of these powders was found in her room. Her condition on admission was: Temperature, 100.4° F.; pulse, 130; respiration, 40. Patient is unconscious. Respirations are stertorous. There is no muscular rigidity, no twitchings and no paralysis. In response to pin pricks the patient draws away the hands and feet. The patellar reflexes are absent. The pupils are moderately dilated and react somewhat sluggishly to light. (The pupils were said to be "pin point" when she was first discovered.) The patient is unable to swallow, and does not arouse to any of the usual forms of stimulation.

The heart and lungs are normal. There is edema of the extremities and Kernig's sign is absent. No tache is manifested nor rigidity of the neck.

October 21: Urinary examination gave specific gravity 1.018; trace of albumin present; no casts. Temperature since admission has varied from 100° to 101° F. There has been incontinence of urine, and bowels were moved in response to croton oil, otherwise the condition is unchanged.

October 23: Urine, 1.024; trace of albumin; a few granular casts; many red and white blood cells.

October 25: Patient removed to another ward. Nurse reports that patient's back is very red over the sacrum, the skin in this location is slightly abraded. Incontinence of urine continues, though the patient is regularly catheterized. Patient seems a little brighter. The temperature has gradually been rising about one degree daily since Oct. 21, and is 104° F. to-night; leucocytosis of 14,000; eight grains of urea per ounce of urine.

October 27: Yesterday the patient twice took two ounces of water by mouth, otherwise all nourishment has been administered by stomach tube. The pulse averages 130; patient put on "mixed treatment."

October 29: The patient moans a good deal at night. Temperature varies from 102° to 104° F.; pulse about 140.

October 30: The patient spoke once yesterday, otherwise there has been no change. She spoke again to-day; was very noisy during the night. Urine: 1.029; faint trace of albumin; few hyaline casts; five grains of urea per ounce. The amount of urine has averaged over 30 ounces in so far as can be ascertained. The bed-sore is rapidly getting worse. White blood cell count 20,000; Widal reaction negative.

November 2: Yesterday morning the patient spoke rationally, complained of headache and of pains all over. She moved the head and hands; knee-jerks still absent; Babinski reflex marked; spoke again to-day; takes nourishment by mouth; incontinence of feces since yesterday; patient very noisy at night; mixed treatment discontinued. Redness and edema over both mastoid processes, no discharge from ears, drum membranes are intact, and there is no rigidity of the neck. A bed sore is developing over the right heel, and the sacral bed-sore has sloughed to the bone.

November 6: Yesterday the foot-drop was marked. There was no muscular response to pin-pricks, nor does patient wince when pricked on the legs, but when she is pricked above the knees and on the trunk, she does. Her temperature is 102° to 105° F.; pulse 140-160. Patient is placed on bromides grs. xxx q.4.h.; moaning almost constantly. Despite cardiac stimulation the pulse became weaker and the patient died with a temperature of 106° F. at 1.30 P.M.

Blood cultures taken several days before death were reported negative. The patient had begun to menstruate several days after admission, which probably accounts for the presence of blood in the early specimens of urine. Examination of the eyes several days before death showed no ocular disease. A post-mortem examination was obtained shortly after death. The necropsy was conducted by Dr. Theodore Janeway, to whom I am indebted for the tissues of the case. No gross

* I am indebted to Prof. Hermarn M. Biggs for the history of this case, and for permission to include it in this study.

lesions were found. It was noted that the cerebral tissue was somewhat lighter than normal in color, and its consistence was perhaps slightly increased. The protocol is not incorporated in this study, since its findings, bearing on the neurological symptomatology, are entirely negative.

Immediately after removal from the body the tissues were placed in 3 per cent. formalin solution. They were subsequently removed to appropriate fluids for the methods utilized in this study.

*Microscopical Examination.—Cerebral Cortex:* (Left precentral lobule). The lymph spaces of the pia-arachnoid are greatly dilated and contain a serous exudate in which lymphocytes are abundant. These cells have also infiltrated the stroma of the membrane. Connective tissue cells are numerous, and their nuclei show many evidences of proliferation. The blood vessels of the membrane are moderately congested, but their walls are not thickened and they are otherwise in normal condition, except that several of them contain masses of antemortem clot. A few small *Corpora amylacea* are found just beneath the pia-arachnoid and in the cortical tissue. They are also present in the membrane, but in less number. The outer layer of the cortex shows considerable fine granular disintegration, apparently from maceration by the meningeal effusion.

The blood-vessels throughout the cortex and in the subcortical white matter are much congested. Their walls are not thickened, but the perivascular lymph space is almost universally dilated; the lymph channels independent of the blood-vessels are also generally dilated. There are a few small oval or circular areas of lymphocyte infiltration scattered throughout the cortex, they seem to have no definite location, but are usually associated with a patch of unusually highly cellular neuroglia.

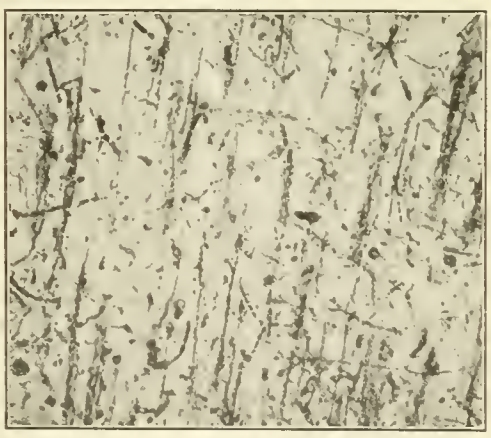
The layer of tangental nerve fibers shows a considerable number of fibers which exhibit large varicose swellings, sometimes of very large size and separated by narrow constrictions. Other fibers have become entirely broken up and their sheaths contain large clear vacuoles, indistinct lines of granules, or entirely refuse the stain. *Corpora amylacea* are found in this layer, but they are infrequent and of small size. Otherwise the molecular layer of the cortex shows nothing except the general lesions already mentioned. (Hematoxylin and Eosin, Pal-Weigert, Marchi.)

The layer of small pyramidal cells shows no gross ganglion cell alteration, no distortion, shrinkage or disintegration. Frequent cells, however, exhibit alterations in the chromophilic plaques (Nissl's methylene blue), and in some cases the nucleus is also altered in its appearance. The most frequent change appears to be a tendency toward chromatolysis, but occasional cells show the chromatic substance broken into small, very highly staining masses.

The ganglion cells of the large pyramidal cell layer (Nissl's stain) show more marked changes. Some of them are shrunken and respond diffusely to the stain, showing none of their finer normal structure, while others exhibit no variation in general form, but manifest cytoplasmic changes. These consist most commonly of a general chromatolysis, sometimes affecting both cytoplasm and nucleus, but generally seen only in the protoplasm. Another common form of degeneration, probably a less marked type of that just mentioned, is a breaking down of the plaques into a fine, slightly chromatic detritus. In the less marked stages the general outline of the normal chromatic arrangement is still seen but it has failed to respond to the dye. Wherever the cell protoplasm is degenerated, like changes are generally also present in the processes of that cell. In some places distinct spindle-shaped swellings of the neurit and dendrites are present. A considerable percentage of the cells show a tendency of the nucleus to wander toward one side of the cell. Other types of degeneration are evident in these cells, but those mentioned are most frequent. Lymphocytes are found here and there in the pericellular space, sometimes pressing upon the ganglion cell.

The white matter beneath the cortex, representing the fibers from these areas, shows many pathological alterations. One of the most remarkable of these consists of occasional areas in which active proliferation of the neuroglia is present. They vary from 1 to 2 mm. in diameter. In these places many large oval or round cells are found, closely packed together, intermingled with lymphocytes and neuroglia cells. These abnormal cells are about the size of an eosinophilic leucocyte, are usually mononuclear but occasionally contain two nuclei and their cytoplasm is finely granular. The distribution of their chromatin indicates that they are dividing rapidly. They appear like endothelial cells but probably are of neuroglial origin. About these patches of infiltration the invading cells gradually fade off into the tis-

Fig. 1.



Microphotograph. Objective Leitz No. 6. Ocular No. 3. Degenerated fibers in subcortical white matter. From left precentral lobule. Marchi's method.

sue becoming more and more scattered, so that no marked line of extension is present. Many of the lymph channels in this region of the brain are dilated, or contain the remains of an exudate apparently of serous character. *Corpora amylacea* are also found in various stages of formation, but they are not numerous. Numerous degenerated nerve fibers are demonstrable in these areas. (Pal-Weigert, Marchi.) The degenerations are apparently of somewhat recent origin, and many of the degenerated fibers incompletely retain the Pal-Weigert stain.

*Anterior Portion, Left Inferior Frontal Gyrus* (Marchi's method).—Changes similar to those described in the precentral lobule are present, but

Fig. 2.

Microphotograph. Objective Leitz No. 6. Ocular No. 3. Area of cellular infiltration in subcortical tissue of left precentral lobule. Thick section. Stained in hematoxylin eosin.

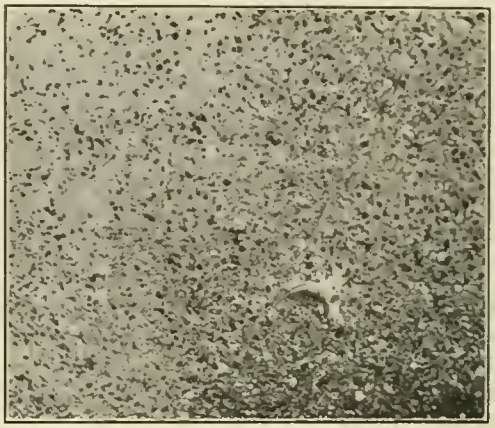
the alterations are of very much less marked degree and the number of degenerated fibers in the subcortical white matter is small, only five or six being seen in each Zeiss "D. D." field.

*Left Superior Temporal Gyrus* (Marchi's method).—Degenerated fibers are more frequent in these sections than in those of the previous gyrus, but they are still infrequent. The lymphatic and vascular lesions are also more marked, but much less so than in the precentral lobule.

*Left First Occipital Gyrus* (Marchi's method).—Degenerated fibers are abundant, but are less numerous than in the first lobule examined. The other lesions are present in corresponding degree.

*Left Internal Capsule.*—Small areas of cell infiltration, similar to those described above are found in the tissue of the nuclei bordering on the internal capsule. Some of the larger-sized vessels passing through the internal capsule are surrounded by quite marked infiltrations of small round cells. With these are a few polynuclear cells and in the surrounding tissue a few plasma and other cells similar to those of the other infiltrated areas. *Corpora amylacea* are numerous about the lymph spaces, some of them are of large size and lie within the clefts. Many of the fibers in the internal capsule are degenerated, and are

Fig. 3.



Microphotograph. Objective Leitz No. 3. Ocular No. 3. Degenerated fibers anterior genu, left internal capsule. Marchi's method.

limited to no particular part of the tracts but are scattered throughout. (Pal-Weigert, Marchi.)

*Cerebellum.*—The membranes of the cerebellum show the same changes as those of the cerebrum, but the infiltration is not so marked. A few large corpora amylacea are present about some of the larger meningeal vessels and in the outer portion of the molecular layer. The blood-vessels of the cerebellum are congested as in the cerebrum, but the dilation of the perivascular lymph spaces is not so marked here as there and the lymph channels in other parts of the tissue are normal.

Many of the Purkinje cells show degenerative cytoplasmic alterations, although all the ganglion cells are free from the grosser pathological changes. The most frequent cytoplasmic lesion (Nissl's stain) consists of a partial breaking up of the plaques into a fine, partially chromatic dust, while the general outline is still evident in most instances; in some cases the remaining fragments are hyperchromatic. A good many of the nuclei in the most altered cells show a chromatophilia. The alterations mentioned generally extended into the cell processes, while the large ganglion cells of the granule layer show very similar protoplasmic changes, but the granule cells show no apparent lesion.

The fibers in the white matter of the cerebellum exhibit nodosities or swellings at various parts of their course, but the degenerations are not advanced or general. (Pal-Weigert, Marchi.)

*Pons.*—The blood vessels throughout are considerably congested, but no areas of extravasation are present. The perivascular lymph spaces show no dilation but the independent lymph spaces show occasional dilations, though nowhere so marked as in the cerebrum.

*Corpora amylacea* are quite numerous, particu-

larly along the floor of the fourth ventricle, and among the fibers of the pyramidal tracts.

Many of the fibers in the pyramidal portion of the pons show extensive and quite general degenerations. (Pal-Weigert, Marchi.)

No sections were stained especially to ascertain the condition of the ganglion cells of the ventricular floor, but by ordinary methods no lesions are evident.

*Medulla Oblongata.*—The blood vessels are quite universally though but moderately congested, and some of them are surrounded by an exudate of small round cells, never very extensive. The perivascular lymph spaces are usually dilated, but not extremely so. *Corpora amylacea* are present and are most numerous just beneath the floor of the ventricle, in the pyramids and particularly just beneath the membranes. The membranes of the medulla show the same changes as were noted in those of the encephalon. One small area on the left side, in the floor of the ventricle, shows a patch of infiltration, but without pus formation. Except for the general perivascular infiltration no direct evidences of inflammation are found.

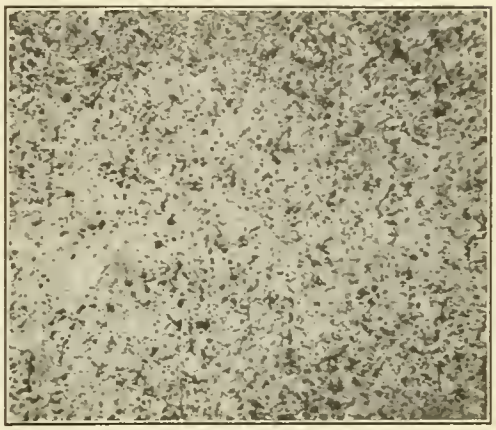
From 40 to 50 per cent. of the fibers in the pyramids of the medulla are degenerated, as shown by the Marchi method; the degeneration is much less apparent in sections stained by the method of Pal-Weigert. The cerebellar peduncles also show quite a number of degenerated fibers, but the degeneration here is by no means general. The fibers in the fillet are normal, but a few degenerated ones are seen in the lateral cerebellar tract. None of the fibers from the *Corpora dentata* or of the other transverse tracts are degenerated.

No gross alterations are present in the ganglion cells of the nuclei of the cranial nerves, situated in the floor of the fourth ventricle, but sections low down in the medulla show pronounced cytoplasmic alterations in the cells of the nucleus gracilis and cuneatus (Nissl method). These changes consist of various degrees of chromatolysis affecting both cytoplasm and nucleus in the most pronounced cases and in nearly all instances most extreme in the central portions of the cells. The plaques are much disintegrated in the most extreme examples, but in other cells are not broken up but simply stain faintly or exhibit a very finely granular condition. There is no cell shrinkage or nuclear eccentricity.

*Spinal Cord* (Cervical Region).—The membranes of this portion of the cord show a general small round-celled infiltration of slight to moderate degree. The blood-vessels are moderately congested, but considerably less so than those of the cerebrum, but the lymph spaces about the vessels and nerve cells and those of independent distribution are generally dilated.

There is a general and almost complete degeneration of the fibers of the direct and cross pyramidal tracts. This degeneration has not become of sufficient standing to show distinctly with the Pal-Weigert stain, but is very evident in sections prepared by the Marchi method. There are, in addition, a great many degenerated fibers

Fig. 4.



Microphotograph. Objective Leitz No. 3. Ocular No. 3. Degenerated fibers in right cross pyramidal tract of cervical spinal cord. Marchi's method.

in the lateral cerebellar tract and isolated degenerated fibers are also seen in the mixed lateral, and posterior zones, particularly in their peripheral portions.

The lymph spaces about the ganglion cells, especially those of the anterior horns, are dilated, but there has been no shrinkage or other gross alterations of those cells except for a frequent tendency toward eccentricity of the cell nucleus. Many of these cells, however, show quite pronounced cytoplasmic alterations (Nissl method). One of the most common of these, is a clumping of the chromatic material into large irregular masses, either in the center or in the peripheral portions of the cell. The spaces between these clumps are often filled in with fine granules of slightly chromatic material. Many of the nuclei show chromatolysis of quite marked degree. Other types of ganglion cell degeneration are also found, probably due in part at least to post-mortem changes or those alterations which immediately preceded death.

*Dorsal Spinal Cord.*—The membranes of this part of the cord show relatively less exudation but the vessels of both the membranes and of the medullary tissue show much more marked congestion than in the cervical portion, as is generally the case, for the dorsal portion of the cord is particularly prone to congestion. The lymphatic dilatation is less marked than in the cervical levels.

The degenerations are of about the same extent and involve the same distribution as in the cervical cord, but the isolated fibers in the mixed lateral and lateral cerebellar tracts are rather more infrequent. The number of degenerated, though always isolated fibers in the posterior tract is, perhaps, greater than in the upper levels. The ganglion cell changes are like those of the cervical cord.

*Lumbar Spinal Cord.*—Meningeal exudation is less marked than in the previous levels and the congestion of the blood vessels is of about the same degree as in the cervical cord, considerably less than in the dorsal portion. The dilation of the lymph spaces is more marked than in the dorsal cord.

In this region the degenerated fibers are more strictly confined to the direct and cross pyramidal tracts, but there are also a good many isolated degenerated fibers in the antero-lateral tracts, those in the posterior tracts are less frequent than in the cervical or dorsal cord.

Ganglion cell degeneration is much less marked in this region, but where present is of the same character as that found above. Nuclear eccentricity is less pronounced than in the upper levels.

*Lumbar Posterior Root Ganglion.*—There is no inflammatory infiltration about or in the ganglion. A good many of the ganglion cells show more or less shrinkage, but there are no other gross changes. The capsular cells of the lacunæ are in normal condition, and exhibit no tendency toward proliferation.

The cytoplasmic condition of the cells shows a considerable variation. Some of them appear perfectly normal (Nissl stain), but others exhibit a finely granular disintegration of the plaques, generally with proportionate chromatolysis, but a few cells show peripheral chromatophilia. The nuclei are apparently normal throughout.

*Sacral Spinal Cord.*—The meningeal exudation is very slight and the dilation of the lymph channels much less pronounced than in the other portions of the medulla spinalis. The degenerations are limited almost exclusively to the small areas representing the cross and direct pyramids. Isolated degenerated fibers in the other tracts are almost absent.

Ganglion cell degenerations are of much more limited extent (relatively) than in the previously considered levels of the cord—nearly all the cells are normal.

Microscopical examination of the tissues of the heart, liver, spleen, kidneys and pancreas showed no marked characteristic or significant changes.

The chief lesions of the central nervous tissues may be summarized as follows:

1. Cerebrospinal meningitis, probably secondary to cerebritis and of the "cellular" type as described by Delafield and Prudden.

2. General non-septic cerebritis affecting all parts of the cerebrum, but most marked in the cortex and particularly so in that of the motor areas. The disease is characterized pathologically by perivascular round-cell infiltration, dilation of the lymph spaces and by areas of neuroglial proliferation. The changes are further identified as inflammatory by the presence of occasional plasma cells.

3. Degeneration of many of the ganglion cells of the cortex. From the character of the lesions of these cells it is inferred that in most cases the changes have been of recent origin. Possibly some are post-mortem alterations.

4. Degeneration of many of the fibers arising from the large pyramidal cells of the cortex, most marked in those derived from the motor areas.

5. Diffuse degeneration affecting many of the fibers passing through both internal capsules.

6. Inflammation of the tissues of the cerebellum, of much less marked degree than in the cerebrum, but apparently of the same character and accompanied by similar, but much less extreme changes in the cells and fibers.

7. Degeneration of many of the descending fibers of the pons and medulla.

8. Degeneration of the chief descending tracts of the spinal cord with degeneration of occasional fibers in ascending tracts, possibly aberrant descending fibers.

9. Slight, probably secondary cytoplasmic degeneration of the ganglion cells of the anterior horns of the spinal cord.

In brief, we are dealing with a diffuse non-suppurative inflammation of the brain, most marked in the subcortical motor areas, with the resulting degeneration of those axis cylinder processes which extend into the spinal cord and which have their origin in the involved portions of the cortex.

Our examination has demonstrated clearly that the case is one of organic and not functional disorder, and the pathological findings satisfactorily explain the symptomatology of the case.

As to the origin of the disease, however, nothing is explained. From the character of the changes in the tissues and from the bacteriological examination of the blood, I think that we are safe in assuming that the cause was not infection.

The almost inevitable conclusion must be, unless some additional facts in regard to the case are discovered, that the lesions are of toxic origin. This toxin may perhaps have been of bacterial origin, for instance, it is stated that like conditions have resulted in influenza. It may have been of metabolic formation, or possibly some drug introduced in toxic doses. It has been noted in the history that the patient was in the habit of taking various headache powders, and it is possible that these may have caused the cerebritis, though I have been unable to find any drug, excepting alcohol, and possibly morphine, which are recognized as inducing alterations like those found in this case. Experiments are now under way by means of which we hope to prove or disprove this possibility.

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**Diagnostic Value of Lumbar Puncture.**—Greater care in drawing conclusions from the data obtained by lumbar puncture in cases of cerebral disease, is urged by G. Orgelmeister (Arch. f. klin. Med., Vol. 76, No. 1-3). In fifteen undoubted cases of tuberculous meningitis, in which this procedure was employed, the formation of floculi in the fluid, considered by many authors to be a distinct characteristic of the disease, was entirely absent in four. The finding of the tubercle bacilli, is the only means of making an absolute diagnosis, and in suspected cases of localized cerebral disease, a positive bacteriological result can form the only contra-indication for operative interference.

## THE FORM OF THE URETER.

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The ureter is not a uniform calibered tube but consists of ureteral dilatations and constrictions. Calculi lodge at the ureteral isthmuses or constrictions as well as at the turns of compromising flexions. Surgery should be performed at the ureteral dilatations on account of ample lumen and easier manipulation.

Fig. 1 illustrates the form of ten ureters distended with paraffin, demonstrating (*a*) the three ureteral dilatations, spindles (reservoirs) (2, 4, 6); (*b*), the three constrictions sphincters (3, 5, 7,) and (*c*) the spirality was noted while distending the ureters with melted paraffin, the free ureter would rotate from right to left about two circles.

Nos. 1 (left) and 2 (right). Man, age forty-six years. This pair shows the left calyces (1, 1) dilated and a well-developed pelvis (2). The left proximal ureteral isthmus (3) well marked and distalward located, the right (3) indistinct and elongated, less constricted. The left lumbar spindle (4) the most prominently developed and the more distalward located. The middle isthmuses (5, 5) moderately marked. In each ureter two pelvic spindles (6, 6) exists. The distal isthmuses (7, 7) were less in lumen than the proximal (3, 3).

N. B.—The left ureter 1, presented 5 well-marked spinal ridges projecting in the ureteral lumen. All ureteral dilatations are more prominent in the left. The left ureter (1) was one inch longer than the right (2).

The left ureter (1) is complete, *i.e.*, it presents four calyces (1, 1), pelvis (2) ureter proper and the renal artery lying on the ventral surface of the

calyces and pelvis. The calyces and pelvis were the result of corrosion anatomy. Nos. 3 (left) and 4 (right) woman—. This pair shows well marked right calyces (1, 1), well-developed oval pelvis (2), and distinctly marked right narrow proximal isthmus (3). Prominent right lumbar spindle (4). The right middle isthmus (5) should be placed on a level with the left middle isthmus (5).

Two pelvic spindles exist in each ureter (6, 6). The right lumbar spindle is generally larger in woman than man. The distal isthmuses (7, 7) were larger in caliber than the right proximal (3).

No. 5. (left) lumbar spindle (4) and two short pelvic spindles (6, 6). No. 6 (right) shows short narrow proximal isthmus (3). Two large and one small lumbar spindle (4—), a narrow middle isthmus (5), a short well-marked pelvic spindle (6). Nos. 7 (left) and 8 (right); man, age forty-six years. This pair shows moderately developed calyces (1, 1), double armed slightly developed rounded pelvis (2, 2). Marked but distally located proximal isthmuses (3, 3). Short but marked lumbar spindles (4, 4). Moderately marked middle isthmus (5, 5). Two unequally sized pelvic spindles, on each side (6, 6). Distal isthmuses (7, 7) about equal in lumen to the proximal (3, 3). Nos. 9 (left) and 10 (right), woman, age forty-nine years. This pair shows moderately developed flattened right pelvis (2). Indistinct elongated proximal ureteral isthmuses (3, 3). Slightly developed left lumbar spindle (4) but more marked right one (10). The middle isthmus is but slightly marked on left (5), on the right more marked. The right (10) shows two large and one small pelvic spindle (6, 6). The left ureter (9) shows one pelvic spindle (6°). The distal isthmuses (7, 7) are less in caliber than the proximal.

I removed the ureters here illustrated at post mortems, through the courtesy of Prof. W. A. Evans, immediately injected them with melted paraffin, subsequently dried and painted them white. Dr. William E. Holland executed the photograph. The pairs of ureters are valuable for comparison.

## A SIMPLE AND RAPID CHROMATIN STAIN FOR THE MALARIAL PARASITE.

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THE recent increase in our knowledge of the alterations in the morphology of the blood which occur in disease is largely due to the simplification in the technic of staining which has been so pronounced in the last few years. As a result of this technical simplicity the clinician has at his disposal the means for the rapid and easy preparation of suitably stained blood smears, and in consequence a large amount of material has been observed and recorded. Believing that any improvement in the technic of blood staining which tends toward ease and simplicity of manipulation may be of use to students and teachers of blood morphology, the writer has felt that certain methods which he has found valuable may not be without interest.

The first experiments were based upon an accidental observation that old alcoholic solutions of the eosinate of methylene blue in the form devised by Jenner[1], and republished as an independent discovery by May and Grünwald[2] three years later, are capable of giving a fairly good chromatin stain in the young forms of the malarial parasite. The methylene blue component of the dye is apparently altered by the alkali dissolved from the glass of the container and a portion is transferred into what has been shown by Michaelis[3] to be closely allied to, if not identical with, methylene azure. If a slide containing malarial parasites is stained with this ripened Jenner dye and slowly washed off in distilled water, a moderate chromatin stain is produced showing the larger nuclear masses of the ring forms and also the reddish granules occasionally seen in the bodies of the lymphocytes. Such a selective stain is not, however, produced on smears which are dropped quickly into distilled water or washed off under the tap, for the peculiar quality of the stain which causes it to color the chromatic substance appears only when the dye is in a watery solution and depends perhaps upon some phenomenon of dissociation of the components of the salt in water. The alcoholic solution is not dissociated, and its pure blue color is immediately altered to a reddish purple by the addition of water with the formation of an abundant precipitate.

A number of observers have devised staining combinations in which advantage has been taken of the solubility of the eosinate of methylene blue and methylene azure in methyl alcohol and the power which the mixture has to produce a chromatin stain when diluted with water, among them Leishman,[4] Wright,[5] and Reuter.[6] The latter uses the alcoholic stain only as a stock solution to be diluted with water before use; the others fix and stain at the same time in the methyl alcohol in which is dissolved the precipitate formed by mixing eosin and methylene blue, containing some methylene azure produced by previously heating the methylene blue with a dilute alkali.

To obtain a chromatin stain with the Leishman or Wright mixtures it is necessary to dilute the fresh alcoholic dye with distilled water after it has been in contact with the smear for a few minutes, and allow this combination to act for from three to ten minutes upon the blood spread, but the precipitate which immediately forms when the mixture is diluted is very likely to be deposited upon the smear and give rise to annoying artefacts which can only be removed by treating the slide with strong methyl alcohol and repeating the staining process. The writer has also found after a considerable experience with both methods that it is difficult to obtain constant results even when using smears of the same age and thickness and the same preparation of the stain.

The Wright stain especially, when it is successful, affords an exceedingly instructive smear and demonstrates the chromatin granules of the malarial parasite sharply and well; but as a stain for general class use or for preparing large series of slides for the use of students, the writer has not found it as useful as a much simpler method, using the purified methylene azure as obtained from Grübler. The use of the pure dye, the preparation of which we owe to Giemsa,[7] obviates the uncertain and tedious process of preparing

the methylene azure solution by the treatment with alkalies and gives the staining method much of the certainty and simplicity of the old eosin and methylene blue stain so much used before the introduction of the Ehrlich and Jenner combinations. Giemsa and Nocht[8] recommended staining slides for some time in a dilute mixture of the eosin and methylene azure, a method which is necessary for staining old slides, but unnecessary for fresh preparations. The writer has found that while this eosinmethylene azure combination will stain slides which are from two to three years old and produce under these circumstances an excellent chromatin stain without any of the diffuse bluish color which is usually seen in preparations of slides over one month old, a fact of considerable advantage, especially for the purpose of restaining faded demonstration slides or old-type specimens which show some especially interesting features, that an equally good stain of fresh specimens can be obtained as follows.

Fix the preparation for one minute in strong methyl alcohol, wash off in water and stain the slide for a few seconds with a one-tenth-per-cent. aqueous solution of yellowish eosin. The surplus of the eosin solution should be poured off and a few drops of a one-fifth-per-cent. solution of methylene azure poured over the slide. The staining will be complete in from one-half to one minute and the slide may be washed with distilled or tap water and dried with blotting paper. The best paper for this purpose is a thick, smooth-surfaced variety used by photographers to dry prints. The close grain and hard finish of this paper prevents the deposition of any fiber on the surface of the blood smear.

A longer treatment with the azure solution produces a deeper chromatin stain, a shorter treatment produces a stain of less intensity. If a stain of any particular depth is required the whole process may be easily observed under the microscope, selecting a group of leucocytes as a guide. The stain will be seen to gradually color the nuclei of the polynuclears a deep red, and at the proper point the neutrophile granules will be easily visible with a good four mm. dry lens. At the same time the nuclei of the large and small lymphocytes assume a deep red color and the cell bodies of the large forms color a pale blue, while the bodies of the small cells will be a deep blue. At this stage of the process the malarial parasite is of a pale blue color with deeply red chromatin granules. If the methylene azure has remained in contact with the smear but a short time the red cells will be of a bright pink color, but if the staining is prolonged the red cells become bluish or greenish in color. After prolonged staining with the azure the color of the neutrophile granules generally fades and the bright pink of the eosinophiles is replaced by a bluish tint. For general purposes, therefore, it is best not to stain the slide too long with the methylene azure. By increasing the strength of the azure solution up to one-half of one per cent. the staining process with that substance may be shortened to a few seconds, but overstaining is much more likely to take place. If the blue color of the red cells is very marked the excess may be removed by treating the smear for about one second with dilute alcohol, say of about 80 per cent., and then washing off in water. Some color is likely to be removed from the nuclear chromatin by this process of decolorization, and the red of the finer chromatin particles of the gametes loses its sharp outline or may be entirely extracted so that the alcohol treatment is not to be recommended for general use. Thus by the use of this process a good chromatin stain can be obtained in three minutes after the blood smear is secured. Such preparations may also be used for differential counting, though for general purposes the Jenner mixture is preferable because the eosinophile and basophile granules are on the whole more characteristically stained. The large and small lymphocytes on the other hand are better demonstrated with the methylene azure. The large mononuclears cannot be constantly separated from the large lymphocytes by any of the dyes containing methylene blue, and are best classed with the large lymphocytes. Beginners may mistake the blood plates, which often lie in depressions in the red cells, for malarial parasites, especially as they stain red with the chromatin dyes. The distinction must be made by the differences in morphology. The blood plate is not sharply outlined and the nuclear substance is in the form of an indistinct mass not surrounded by a clear zone, while the small ring-form of the malarial parasite is very sharp in its outline, as is also the chromatic substance, the latter being surrounded by a clear zone and beyond this by the blue ring of the body of the parasite.

The staining of old preparations cannot be achieved in a satisfactory manner with any of the usual blood stains except the Ehrlich triacid, which does not demonstrate the malarial parasite. By the use of dilute mixtures of eosin and methylene azure, as suggested by Nocht, it is possible to obtain perfect stains from slides which are months or even years old. The older the slide the more dilute must be the stain, and the longer it must remain in the staining fluid. Two methods may be used. The slide should be fixed for at least half an hour in methyl alcohol. Then it may be allowed to remain for from four to twenty-four hours in a strong mixture containing about 50 c.c. of a one-to-a-thousand methylene azure solution to which has been added from two to five c.c. of a one-to-a-thousand aqueous eosin. The mixed solutions are best placed in a Coplin jar and the slides allowed to stand vertically. As a rule, a precipitate is not formed, but if any should form it is not likely to be deposited on the surface of the smear. In case such a precipitate should be deposited on the smear it can be removed by dipping the slide in strong ethyl alcohol for a few seconds and then washing off in water. Slides stained in this manner are usually much overcolored and must be decolorized in 80 per cent. ethyl alcohol and then washed in water. By this means the excess of the blue dye is removed and

the chromatin particles in the malarial parasites are well brought out. The same result may be obtained by staining for from twenty-four to thirty-six hours in the above mixture diluted about five times with distilled water. It is not usually necessary to decolorize slides stained in this dilute mixture. The solutions when once mixed can be used to stain four or five series of slides, after which the color is exhausted.

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## THE CHOICE OF TECHNIC IN OPERATING UPON PROSTATIC OBSTRUCTION.

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I HAVE assembled in this brief article the salient facts in the histories of cases operated upon by perineal galvanoprostatotomy, some of them of quite recent date and others of long standing, in order that, from the record of these cases, the immediate and more or less permanent effect of operation may be noted; and the object of this writing is to demonstrate the fact—or rather to submit evidence bearing upon it—that this operation is applicable to a large proportion of cases in which it is found necessary to remove obstruction to the bladder outlet for the relief of vesical insufficiency when caused either by prostatic hypertrophy or the analogous condition —contracture of the neck of bladder. I believe that the most important element in the causation of vesical insufficiency is the mechanical obstruction at the urethral orifice, and that to accomplish its satisfactory relief the most essential requirement is removal of the obstruction. This obstruction may be an orificial hypertrophy, or a fibrotic contracture, a retro-prostatic lip with a vesical pouch beneath, a greater development of this isthmus in the form of a middle lobe, a unilateral or bilateral enlargement of the prostate obtruding upon the urethra, or a combination of any of these formations. Cystitis may sooner or later supervene and become chronic. It greatly aggravates conditions and favors the development of secondary changes in the bladder wall in the form of muscular atrophy and fibrous infiltration.

The day is not far off—if it has not already dawned—when surgeons will unhesitatingly advise sufferers from permanent prostatic obstruction to submit to early operation rather than await the development of serious secondary conditions, or accept the artificial and not uncheckered existence incident to so-called catheter life.

As recently as two years ago, the weight of opinion expressed at the meeting of the American Association of Genito-Urinary Surgeons favored palliative treatment in the majority of cases. During the past two years, however, much active work has been done along the line of operative procedure; and so many surgeons have demonstrated the practicability of the various operations performed by them, even in cases of an advanced and apparently hopeless character, that there is now evidence of a decided leaning toward operation in the early as well as the late stages of this morbid condition of mature age. This being demonstrated, as one writer aptly expresses it, "Attention should now be directed to perfecting the operative technic, and to convincing the general practitioner into whose care these cases first come that prolonged catheterism even under the most favorable circumstances, is a dangerous practice."

According to the statistics of Sir Henry Thompson, about 33 per cent. of men beyond the age of fifty-five years are subjects of enlargement of the prostate, while not over 15 per cent. ever suffer from symptoms. Thus 85 per cent. of those having hypertrophied prostates experience no inconvenience therefrom, since the direction of the growth is not such as to interfere with the bladder function.

All observers agree that the size of the enlargement bears no relation to the severity of the urinary distress produced. The orificial hypertrophy or fibrous contracture may be the cause of the most intense and uncontrollable symptoms; the small middle lobe may produce complete retention of urine; while a prostate as large as a cricket ball, weighing 10½ oz. and almost completely filling up the cavity of the bladder—as in one of Mr. Freyer's cases (*British Medical Journal*, Nov. 8, 1902)—may be accompanied by only three ounces of residual urine.

Confronted with these facts it is difficult to believe that, in order to relieve the bladder symptoms which occur in only 15 per cent. of the cases, it is essential to remove the entire gland—or in many instances, more than a very moderate portion of it. Numerous reports of middle-lobe enucleation, of partial extirpation of hypertrophied tissue by knife, scissors, with the prostatic rongeur and with the cautery, which have been followed by ideal results, give weight to this view.

Generally speaking we meet three classes of cases suffering from vesical insufficiency, the result of obstruction at the urinary outlet:

1. Those in which there exists one or the other of the different forms of obstruction without cystitis.

2. Those in which there is more or less long-standing chronic cystitis, producing that train of symptoms collectively called "prostatism."

3. Those cases in which the mechanical obstruction, as well as the chronic cystitis, has existed so long that secondary changes involve the bladder, beginning with hypertrophy and ending in atrophy, contraction of the bladder wall, and decided diminishment in the bladder capacity.

Briefly then, in the first class there is simple obstruction, in the second obstruction with inflammation behind it, in the third obstruction, inflammation and secondary degenerative changes. The object of operation in the first class is to remove the obstruction, and in removing it to do so permanently. In the second class, the same object is held in view with the further purpose of draining the inflamed viscus. In the third class, nothing more can be done than is done in the second; and it is sometimes not possible by means of operation to affect the advanced degenerative changes which occur late in these cases.

In order to accomplish the desired result by any operation, it is absolutely necessary to open the way at the vesical outlet, to lower the barrier, so that, if there be sufficient restoration of the lost tone of the bladder muscle, the organ will be able to empty itself completely. This may be accomplished by lobular enucleation of as much of the glandular structure as may suit the taste of the individual surgeon, or by galvanocautery incisions, which aim to burn a trough through the obstructing tissue and contracted orifice. It is quite frequent to find complete retention of urine, advanced secondary changes, and all the conditions peculiar to prostatic hypertrophy without any enlargement whatsoever of the gland, dependent upon orificial contracture of the bladder outlet of a purely inflammatory character; and this same condition is found in conjunction with prostatic hypertrophy. The removal of a large portion of the gland, without enlarging the orificial contracture and lowering the level of bladder neck, may be the cause of failure by operation to relieve bladder insufficiency.

Mr. William Freyer cites a case of complete vesical insufficiency without prostatic enlargement. The patient, aged eighty-four years, had been dependent upon the catheter for twenty-six years. Practically the entire amount of urine was voided by means of the catheter. No enlargement of the prostate was felt by the rectum. It was impossible to introduce a sound through the urethra, but the presence of vesical calculi was suspected. He opened the bladder with a view to removing both prostate and calculi. Two calculi, one inch in diameter each, were found, but, to his surprise, there was no intravesical enlargement of the prostate. With one finger in the rectum and another in the bladder, it was impossible to find any enlargement whatever of the gland. Nothing was done, except removal of the stones, and the result was no restoration of function.

The writer propounds two rather interesting questions in connection with this case: (1) Is it possible that prostatic atrophy succeeds enlargement, and if so, why did the patient not gain the power of voluntary micturition? (2) Was the case a sample of those one occasionally meets with, in which the patient enters on catheter life sometimes long before the age of prostatic enlargement, and if so, why did the patient not gain the power of voluntary micturition, where neither the enlargement of the prostate nor other tangible cause was found to account for this condition? I would answer by stating that contracture of the neck of the bladder is a frequent cause of vesical insufficiency and voluntary micturition will not follow operation unless the obstacle be removed.

Compare with the above case one which is almost a complete parallel to it.

The patient, an old gentleman, sixty-two years old, first appeared in Jan., 1890, complaining of great distress and tenesmus, and suffering from chronic complete retention of several years' duration, being entirely dependent upon the catheter. The presence of vesical calculi was determined with the Thompson searcher. A suprapubic cystotomy was performed. Two calculi, about the size of horse-chestnuts, were removed, and a third encysted stone in the region of the ureter as well. There was no intravesical enlargement of the prostate, and nothing further was done.

The patient made a good recovery from the operation; but there was no change whatever, so far as the vesical insufficiency was concerned.

In the fall of 1902, twelve years later, the patient again appeared; he having, during the entire intervening period, relied upon the catheter. Nov. 11, 1902, a perineal galvanoprostatotomy was performed by my colleague, Dr. Keyes, Jr. A dense contracture of the neck of the bladder was found; the prostate being absolutely normal. The contracture was incised by two galvanocautery incisions. The patient was out of bed on the seventh day and left the hospital on the eleventh day. Six months after the operation the patient continues to enjoy voluntary micturition, which was regained shortly after the operation, and he is able to empty the bladder down to about one ounce. The admirable result in this case is beyond criticism.

To-day the choice of operation may be said to lie between prostatectomy by lobular enucleation and prostatotomy by means of galvanocautery incisions. I shall not undertake to discuss the question of complete or incomplete prostatectomy, or of the relative merits of the supra- or infrapubic routes: it being understood that, by prostatectomy, I refer to the operation which, by avulsion, removes a greater portion of the enlarged gland than directly interferes with the outlet to the bladder.

The opinion of surgeons who are adherents of prostatectomy, regarding the operation of prostatotomy, seems to be that it is adapted to moderate growths, such as bar formation and orificial hypertrophy, and to early operation. By some it is thought preferable in the late stages of the malady, when the bladder is contracted and permanent degenerative changes exist, when the kidneys are involved and the general health of the patient is seriously undermined. The inference derived from such an opinion is that prostatotomy is less fatal than prostatectomy, which is undoubtedly the fact.

No thoughtful surgeon will declare that the mortality rate of prostatectomy is trivial. There is no doubt that under improved technic and in

good hands the mortality has materially decreased in the last year or so. It is variously estimated at the present day as being from 6 to 16 per cent., and I am inclined to believe that, taking an average of all well-known operators, it is nearer the higher than the lower figure. Alexander, whose special work in perineal prostatectomy has been an inspiration in this country to other surgeons, always held a conservative position in this particular and is not inclined to make light of the gravity of the operation performed by him. Of 31 cases reported there were three deaths, or about 10 per cent. William Freyer has up to recent date reported 31 cases of total prostatectomy by the suprapubic route. Of this number there were four deaths: two died of mania, one on the twenty-fourth day and the other in the third week, one died of urinary toxemia, and one on the eighth day very suddenly from what he considered to be a heat stroke; but the manner of death is very suggestive of pulmonary or cardiac embolism. There are two other patients who were operated on by him; but as he did not remove all of the prostate he fails to classify them with the other cases. In studying the detailed history of these fatal cases it is difficult to disassociate the operation from the cause of death.

Guitéras collected 152 cases of prostatectomy by various methods (Nov. 2, 1901, *Jour. Am. Med. Ass'n*), showing a mortality rate of $16^4/_{10}$ per cent.

Parker Syms reports 21 cases of perineal prostatectomy without a death, and thus contributes materially toward decreasing the mean rate of mortality.

In spite of the enthusiasm displayed by one class of surgeons for perineal and by another for suprapubic prostatectomy, there is ever present a reluctance to advise these operations, except in default of milder measures. Thus Dandridge (*N. Y. Med. Jour.*, Jan., 1903) refers to Murphy's method of removal of the prostate by the perineum as the operation which seems to accomplish complete removal of the obstruction with less dangerous disturbance to the parts involved than any of the other procedures yet suggested; but counsels more conservative measures in these words: "I am strongly convinced that the method of choice in the largest proportion of cases of hypertrophy is still the proper and judicious use of the catheter." Mr. William Freyer, one of the most ardent advocates of the suprapubic operation ("Stricture of the Urethra and Hypertrophy of Prostate," London, 1902) in the course of his lectures in which he describes and favors his operation of total extirpation of the gland suprapubically, thus expresses himself: "Holding as I do that in certain cases of this disorder operation is advisable, I have no hesitation in saying that, in the majority, the only advisable treatment is just and cleanly catheterism combined with careful, hygienic living." The habitual use of the catheter with its perils and discomforts is, nevertheless, an unsatisfactory expedient, and it is not in pace with modern surgical advance to rely upon so undesirable a resource.

Prostatotomy is an operation of lesser magnitude than prostatectomy, and if demonstrated to be safe and effective, the earlier it is employed the safer it is bound to be and the more satisfactory will be the immediate and ultimate results.

By performing prostatotomy by means of galvano-caustic incisions the operation is much simplified and convalescence shortened. The value of galvanocauterization in performing prostatotomy has been amply established. The operation is done either through the urethra (Bottini) or through a perineal wound (Chetwood). The selection of technic must be made by comparing the merits of the two methods.

Aside from the question of mortality, which, according to different observers, varies between 6 and 12 per cent., there are, to my mind, a number of insurmountable obstacles in operating by the Bottini method: the uncertainty of the nature of the prostatic growth, its size and conformation; the difficulty of determining the proper length of the incision, especially in the case of a soft prostate; the inability to verify results immediately, and consequently the necessity of performing repeated operations in some instances; the danger of postoperative hemorrhage and sepsis; the absence of vesical drainage. These objections are variously answered by the adherents of the operation, but have not been removed. I can understand that adroit manipulators of the instrument and expert cystoscopists become past-masters in the performance of the Bottini operation: and yet we read of such accidents as render the operation objectionable, even at the hands of these experts.

Freudenberg actually incised a fold of bladder with fatal results. Young states that death was caused in several instances by division of the membranous urethra on account of hemorrhage and extravasation. Too long an anterior incision has also caused a fatal issue and resulted in the abandonment of that incision. In one of Freudenberg's cases, the beak of the instrument burrowed through the rectum. Bangs, Guitéras and Meyer have cut into the membranous urethra, and in two instances the patients were saved only by prompt perineal section. It has been necessary to open the bladder above the bone to control severe hemorrhage soon after the operation, and later to turn out decomposed and septic blood clots.

Perineal prostatotomy with the galvanocautery I have found possesses all the advantages that may be claimed for cauterization and would seem to meet the objections raised against the Bottini method. Perineal cystotomy, which is the first step in the operation, permits an ante- and postoperative examination and affords complete and adequate drainage. I shall not give a description of the technic, having already done so on previous occasions.

Forty-five cases of various types have in all been operated upon by myself and my colleagues. The first 23 patients have been reported

before the American Association of Genito-Urinary Surgeons. The histories of these cases have been published in detail (*N. Y. Med. Record*, May 18, 1901; *N. Y. Med. Jour.*, May 31, 1902). I have been able to trace up many of these patients, and those heard from have maintained the improved conditions which were reported as a result of the operation.

There have been 22 patients subsequently operated upon. One was below forty years of age, and 4 between forty and forty-five years. Of the remaining 17 patients, one was fifty-one and one fifty-six, and the others between sixty-three and seventy-nine years old. Five patients were cases of contracture of the neck of the bladder as a result of chronic, refractory posterior urethritis. Five patients were cases of contracture of the neck of the bladder in men of mature age (between fifty-one and seventy-four years), all of whom had exhibited characteristic prostatic symptoms for from one to fifteen years. All of them had considerable residual urine; three of them complete retention, in one of whom it had existed for 15 years. Three patients presented a moderate enlargement of the prostate, combined with marked contracture of the neck of the bladder, their ages being sixty-five, seventy-two, and seventy-three years respectively. They had all complained of the characteristic symptoms of prostatism for a number of years. One patient had a median lobe, two patients bilateral enlargement with median growth; and six patients bilateral lobular enlargement.

In reviewing the results in the entire number of 45 cases, there are three recent cases still under treatment, and the outcome of operation can not be estimated, although they all promise well. There has been but one death directly associated with the operation; and this one, an old man with a fatty heart and generally septic, who died on the sixth day. One patient died seven weeks after the operation from renal insufficiency, he having had only one-half of one per cent. daily secretion of urea, or one-quarter of the normal output, before operation. From the fact that he lived five weeks in this condition, it does not seem that the operation precipitated the end. In another patient who died, the post mortem showed as the cause of death an enormous, old, pyonephrosis, with a pus sac as large as an infant's head, which was not recognized before operation on account of the symptoms having been entirely vesical. Another died without unfavorable symptoms connected with the seat of operation, but developed a general peritonitis from rupture of a duodenal ulcer, he having had intestinal symptoms for years previously. An exploratory operation revealed the condition and the post mortem confirmed it.

Of the remainder, this leaves 30 cases cured or materially improved, five partially improved, and three not improved two of which were tuberculous. All presented symptoms of more or less severe cystitis. Residual urine varied from three ounces to a pint in a large percentage of the cases. In only three cases of contracture was there none.

The results are measured by comparing the conditions before and after operation. In those cases which were recorded as materially improved or cured the symptoms of vesical irritability and the residual urine have disappeared or materially diminished, and the patients are generally satisfied with their condition. The catheter has been dispensed with in all but one case, and in this one there is evidence of returning voluntary urination.

As a result of experience in these 45 cases, I feel that the following conclusions are warranted:

That prostatotomy is less dangerous than prostatectomy; that it is the operation of choice in a large number of cases of prostatic obstruction, notably those of moderate glandular enlargement, orificial hypertrophy and contracture, in which the prime object is removal of the obstruction and depression of the bladder orifice; that galvanocaustic incisions, when combined with perineal cystotomy, accomplish satisfactorily the desired result, shorten the operation, and minimize its dangers.

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## SO-CALLED "STOMACH-ACHE."

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In but few departments of human pathology is the physician so dependent on the patient's own history of his symptoms, as in the domain of diseases of the abdominal organs, if he desires to make an exact diagnosis and institute a rational line of treatment. While the oculist, the gynecologist, the dermatologist and the genito-urinary surgeon require only a few subjective statements from their patients and rely almost entirely on their own objective findings to locate the seat and nature of the disease, the diagnosis of chronic diseases of the viscera, as of those of the nervous system, requires thorough inquiry into the history and careful, critical weighing of the patient's statements. He who understands how to weed out the unimportant features from the complaints and stories of a given patient, and emphasize sufficiently the essentials, without falling into the errors of a "snap-diagnosis," will often find it easy to make a correct diagnosis from the history alone.

One symptom common to the most varied forms of internal diseases, and reappearing with almost malignant constancy is what is commonly called "stomach-ache" (Magenkrampf). Under this name the layman sums up all colicky pains which

*This short paper by Dr. Cohnheim appeared in the *Deutsche-Medicinische Presse*, No. 12, Vol. 28. Dr. Cohnheim's position in Berlin, where he was for some time Boas' assistant, and now conducts a large clinic of his own, is such that anything from his pen bears the weight of careful thought as well as ripe experience.
W. G. S.

make themselves felt in the epigastrium or its neighborhood, whether, as we shall see further on, they have their origin in the stomach, the colon, the liver, the heart, the uterus, the intercostal spaces, or elsewhere.

In discussing this symptom we shall for the present separate from the unpleasant sensations which may occur in the epigastrium, all such as partake of the character of pressure, or at least of painful pressure. Almost every sufferer from stomach trouble will complain of "stomach-ache." Our first task is to find out whether this "stomach-ache" represents real pain, or only an unpleasant sensation of pressure, tension, fulness, burning or eructation, especially after taking food. Many patients will admit at once that they have never had real pain, even when their complaints have been of from ten to twenty years' duration. None of these cases concern us, for they either belong under the head of nervous dyspepsia and atony of the stomach, or, if the unpleasant sensations are most pronounced after eating hard or heavy food such as black bread, potatoes, beef or pork, of gastritis.

A certain number of patients, when questioned about the nature of their pain, report as follows: The pains are burning, boring or cramp-like in character, with a feeling of contraction in the pit of the stomach. They commence either in the epigastrium, sometimes a little to one or the other side of the median line, but generally exactly in the median line, or they commence in the back. They may, however, start at the umbilicus, the lower end of the sternum, in the middle of the abdomen or in the right iliac region. From these starting points the pain may radiate in all directions—upward as far as the sternum, the shoulders and the intrascapular spaces, laterally to the arms and sides of the chest, and downward to the symphysis pubis. The intensity of the attacks may vary greatly, also their causes and the manner of their commencement, duration and termination. There are likewise great variations in the means used to successfully stop these attacks, be they home remedies or those prescribed by a physician. Lastly we find differences in the accompanying symptoms and in the relation of the attacks to the taking of food and to defecation.

We shall now see how it is possible by means of the above-mentioned points to determine in almost all cases the exact cause and location of the "stomach-ache" or gastralgia, without the absolute necessity of a physical examination or the use of the stomach-tube.

It is to-day accepted as practically certain, that the group of symptoms called "gastralgia" is caused by disease of the sympathetic plexus. Buch (*Archiv für Verdauungskrankheiten*, Bd. VII, Seite 535) has recently discussed these relations very clearly and thoroughly. He says that under normal conditions the sympathetic plexus is non-sensitive to pressure, but under pathological conditions only a slight irritation is needed to produce disagreeable sensations and ultimately the most severe gastralgia. At the same time the wave length of the sensitive nerves of the sympathetic plexus in regard to appreciating pain, is decidedly shortened. Buch, therefore, makes the logical suggestion, that we call this group of symptoms "epigastralgia," in order thereby to emphasize the fact that the pain is felt in the epigastrium, without necessarily having its origin there. I should like to follow Buch's example, and henceforth speak only of epigastralgia.

In proceeding to the special consideration of so-called gastralgia, we notice that attacks of pain or painful contractions in the epigastrium are observed in the most widely separated affections, and without much discrimination are by the laity called "stomach-ache." Just here it may be of interest to enumerate all the possibilities, and then consider them individually in point of differential diagnosis and treatment. We have to consider:

1. *Heart.* Angina pectoris.
2. *Intercostal Spaces.* Neuralgia, herpes zoster.
3. *Stomach.* Spasm of cardiac orifice, ulcer with spasm of pylorus, stenosis of pylorus, gastric spasm, nervous gastralgia.
4. *Duodenum.* Ulcus duodenale.
5. *Liver.* Biliary colic, cholangeitis.
6. *Pancreas.* Stones, hemorrhage.
7. *Intestines.* Colica mucosa, colica flatulenta, obstipatio spastica. Lead colic. Ileus. Herniæ. Intestinal stones. Enteralgia (in hysteria and syphilis). Acute enteritis and perityphlitis. Embolus of the arteria mesenterica. Tapeworms. Foreign bodies.
8. *Uterus, Kidneys, Ureter, Bladder.* Formation of stones. Colics.
9. *Peritoneum.* Peritonitis.
10. *Spinal Cord.* Tabes dorsalis.

In all these affections the average patient will complain of "stomach-ache" or "cramps." In every case we must discover the cause of the gastralgia, that we may thereby prepare the way for rational treatment. In passing, I would call attention to the fact that in general practice the following three conditions are frequently mistaken for one another—spasm of pylorus after ulcer, cholelithiasis and intestinal colic.

1. *Angina Pectoris.*—Here the attacks of colic are entirely independent of eating. They begin more in the region of the heart and radiate thence to the epigastrium, the shoulders, the back and the arms, especially the left arm. The attacks occur periodically, each lasting from a few minutes to quarter of an hour, and they often recur at a particular hour of the day. The diagnosis is easy, especially when the possibility of an attack is borne in mind. Elderly patients with pronounced arteriosclerosis, smokers, and syphilitics are prone to this trouble. It is unnecessary here to discuss the pathology and therapy of angina pectoris.

2. *Intercostal Neuralgia*, after "taking cold" and before the eruptive period of herpes zoster. Here, too, the patient complains of "stomach-ache," which radiates sometimes only to the left and sometimes to both sides, encircling the lower

end of the thorax, and reaching even to the back. In these cases the pain may be very severe. It comes on in jerks like supra-orbital neuralgia, and is increased and even started by pressure on the intercostal nerves. With a little care the diagnosis is easy.

3. *Stomach.*—As spasm of the pylorus accompanying ulcer is by far the most frequent cause of gastralgia, I shall consider it more carefully. In this affection the attack of pain always stands in intimate relation to the act of digestion. After light fluid food, such as soups, tea and milk it is usually absent. In a given case it recurs always at the same interval after eating, in some cases this interval is one-half an hour to one hour, in others one and one-half to three hours, in still others as soon as the stomach is empty, *i.e.,* four to five hours after the principal meal of the day, namely from six to seven P.M. and between midnight and 3 A.M. In the large majority of cases we find the secretion of hydrochloric acid above normal. Some authors claim that this alone is sufficient to produce spasm of the pylorus, but that this is not the case and that we must seek another reason, is evident from the fact that in numerous cases of nervous superacidity and gastritis hyperacida, after abuse of alcohol and tobacco, pressure symptoms are present after eating, but not spasm. This other reason can only be an ulcer, erosion, or fissure of the pylorus itself, or in the pars pylorica of the duodenum. Ulcers situated in other parts of the stomach run their course either entirely without symptoms, until hemoptysis takes place, or cause at most a burning, gnawing or boring pain, but never a spasmodic one.

I am well aware of the fact that many authors regard these pains in the epigastrium occurring regularly two to three hours after the principal meals, cramp-like and radiating in all directions, as essentially an expression of hyperchlorhydria, which may lead to an ulcer. I am, however, of the opinion that the ulcer is always primary and the hyperchlorhydria secondary, as a result of congestion and stagnation in the stomach.

By no means every ulcer is accompanied by hyperchlorhydria: there are plenty of cases with regularly recurring gastralgia after meals without hypochlorhydria, which recover promptly under treatment for ulcer.

A characteristic point in this sort of gastralgia is its stopping after the use of such antacids as bicarbonate of soda and magnesia usta, as also after warm drinks or a bit of bread. The explanation of this is not difficult. The superfluous free hydrochloric acid is diluted or combined and its corrosive action on ulcer, erosion, or fissure of the pylorus is counteracted. Thus the pain disappears, only to return again when a fresh unneutralized amount of HCl is secreted.

These cases of ulcer of the pylorus with hyperchlorhydria, easily recognized clinically by spasms of the stomach occurring at regular intervals after eating, form a transition to cases of stenosis of the pylorus. This latter condition may be a spastic one, or the result of scar tissue, both consequences of an ulcer, and sooner or later will lead to gastrectasia unless prevented by therapeutic measures.

Other forms of gastrectasia result from adhesions of the pylorus or pars pylorica with neighboring organs, or from compression from without. Thus it may be occasioned by gall-stones, tumors of the pancreas, peritoneal adhesions, etc. By these mechanical obstructions, the normal mobility of the pyloric end of the stomach is impaired and as this is the real motor force of the stomach, it follows that insufficiency, that is dilatation of the stomach, must result when the compensatory hypertrophy of muscle, in the course of time, has reached the limit of its capability to resist. In all cases of gastrectasia, the group of symptoms resulting in gastralgia appears when the stomach endeavors to force its contents through the narrowed passage into the gut. In the form of ectasis due to pyloric spasm, the stomach cramp occurs usually twice in the twenty-four hours, namely late in the afternoon and at night; in the other forms the cramp comes irregularly, when the overful stomach tries to empty itself of its contents, and owing to the narrow pyloric orifice does so into the esophagus.

The treatment of all these forms of gastralgia is that of the underlying malady, that is as if there were an uncomplicated ulcer present. If at all possible, make use of Leube's rest-and-gruel cure, and finally send the patient to Carlsbad, which is the sovereign cure for this form of ulcer when combined with hyperchlorhydria and spasms of the pylorus. We can also make use of the Mühlbrunnen at home, using two cups in the morning and one in the afternoon.

Of medicines I commonly use extract of belladonna, which limits the secretions, combined with bismuth, magnesia or sodium bicarbonate.

In recent cases of ulcus chloroticum I use, according to Boas, a solution of silver nitrate 1 to 400 giving a tablespoonful in a wineglassful of distilled water three times a day, quarter of an hour before meals, and confining the diet to soups and purées. In very old cases of ulcus chloroticum, and in all cases of ulcers especially in men, the result of chronic pressure on the epigastrium, I give, according to Fleiner, 10 grains bismuth subnitrate suspended in a glassful of lukewarm water on an empty stomach one hour before breakfast.

As an after-cure, I let my patient drink every morning, warm vichy, using later an emulsion of sweet almonds. I have also used to advantage in such cases Bellocq and Bergmann's chewing gum in tablet form and temporarily $^1/_{120}$ grain atropine tablets. In stubborn cases I have had good results from the use of oil, of which I have written elsewhere. In such cases I give a wineglassful of warm olive oil in the morning on an empty stomach, and repeat it at night if necessary. It can be administered either by mouth or by stomach-tube.

These methods of treating gastralgia due to

spasm of the pylorus have always worked well in my hands, except in cases of stenosis of the pylorus due to cicatrices or malignant growths. In such cases surgical interference is necessary, when lavage has failed.

Purely nervous cardialgia is very rare, as I wish, contrary to accepted views, especially to emphasize, and as is apparent from our discussion. It is only to be taken into consideration, after excluding gall-stones and intestinal colic, when it appears sporadically in nervously inclined patients after a psychic trauma. Usually it is accompanied by a dilatation of the stomach, because of the coexisting cardiospasm, which prevents the escape of gases. The attack ends with eructation. The treatment consists in hot compresses, hot valerian or peppermint tea and tincture of belladonna.

We may add to the affections simulating gastralgia, the symptoms of painful empty stomach, discovered by Boas. These painful pyloric contractions occur in nervous people whenever the stomach becomes empty, without producing any change in its chemistry. The pain is relieved by frequent small meals.

We find these painful contractions also occurring in gastritis atrophicans when the stomach becomes empty especially about 3 A.M.

In these cases the cause is a compensating hypertrophy of the pyloric muscles, the result of the effort necessary in constantly forcing coarse unchymified food into the duodenum, an effort greater than that required where the food is thoroughly chymified.

4. *Duodenum.*—Symptoms of gastralgia appear in cases of ulcer and stenosis of the duodenum exactly as in pyloric ulcer. As the treatment is the same in both sets of cases, a differential diagnosis is of little practical importance. We think of an ulcer or stenosis of the duodenum only, when during the course of an illness resembling ulcer of the stomach we notice icterus, or find bile constantly in the stomach contents.

5. *Liver.*—Laymen almost always mistake gall-stone colic for stomach-ache, and even physicians frequently do the same.

In such cases we must notice especially that the cramp occurs only sporadically, or periodically, and that after intervals of quiet of months or years, attacks may occur singly or in rapid succession. Rise of temperature and icterus accompanying such attacks are a pretty sure sign of biliary colic.

Inflammation of the gall-ducts without the passage of a stone is enough to produce colic. It happens frequently that gall-stones which have for years lain peacefully and quietly in the gall-bladder, are set in motion and produce colic through some sudden emotion such as anger. There is much truth in the old superstition that violent anger produces colic and jaundice. This is not the place to speak of the treatment of attacks of biliary colic.

As a further point in the differential diagnosis between biliary colic and ulcer with spasm of the pylorus, it should be mentioned that pain on pressure is elicited in the former in the region of the gall-bladder, and on the right side posteriorly, while with the latter it is found in the median line in front and posteriorly to the left of the spine. Furthermore biliary colic is entirely independent of meal times, while spasm of pylorus stands in direct relation to eating.

These differential points should be sufficient to make the diagnosis easy.

6. *Pancreas.*—Attacks of gastralgia due to stones or hemorrhage in the pancreas are only then to be diagnosticated when diabetes or fatty stools are present, otherwise we cannot differentiate between them and biliary colic. The possibility of this condition should however be kept in mind.

7. *Intestines.*—I need only briefly mention the affections which a layman might confound with stomach-ache such as perityphlitis, acute colic with diarrhea, and hernia. In addition to these is embolus of the intestinal arteries, which may produce severe gastralgia, and which is only diagnosed by the subsequent severe intestinal hemorrhages.

Lead colic also produces severe gastralgia, but this condition should not lead to mistakes unless it is entirely overlooked.

Of more importance are the colics accompanying obstipatio spastica, whether produced by gas or mucus, and respectively called colica mucosa and colica flatulenta. How often are these forms of colic confused with genuine gastralgia! Only the condition of the patient's stools saves us from errors. If these colicky attacks occur generally just before diarrheal movements, the diagnosis is easy. We must always inquire carefully about this, as patients are careless in taking notice themselves.

With colica flatulenta, pain ceases or is much lessened after passing wind, and also, as in cases of spasm of the pylorus due to hypersecretion, after warm drinks or hot compresses. Warmth internal or external resolves the spasms of the colon. Very rarely does this form of colic occur directly after meals, and then only in very sensitive patients. Usually such wind colic is entirely independent of eating, and thus easily diagnosed.

We have already noted the treatment of this wind colic. In addition we should forbid the use of cold drinks and food causing flatulence, such as fresh bread, cheese, cabbage, pears, cucumbers, and hard boiled eggs, and give carminatives and, as a matter of routine, belladonna.

Colica mucosa offers similar conditions and is an exacerbation of chronic colitis caused by constipation and abuse of cathartics extending over many years.

During attacks of colic, which are often called "stomach-ache," pieces of mucous membrane are passed, and these readily indicate the diagnosis. When these pieces of mucous membrane are absent, we may suspect a colica mucosa from the passage of irregular lumps of feces of small cali-

ber and surrounded by mucus, and, furthermore, from band-like contractions of the colon.

In treating these cases we have two problems, first to relieve the acute attack, which we do as in cases of wind colic, adding an enema of oil, if needed, and second, to control the chronic spastic obstipation. The diet should consist of food containing a moderate amount of cellulose and plenty of fruit juice and organic acids, such as buttermilk and kefir, and to this should be added several weeks' treatment by means of oil enemata and packs.

With a little thought colica mucosa is like the other colics easily differentiated from gastralgia.

The remaining intestinal affections are so rare that we need but mention some of them, such as acute ileus, strangulated hernia, especially in the epigastrium, and colic resulting from worms and foreign bodies, like pears and fruit seeds. It would carry us too far to discuss each one.

Of these the epigastric herniæ deserve some notice, as the pain they cause may resemble that of ulcer or gall-stone colic. We may avoid mistakes by noting first that they are usually visible and palpable in the linea alba, and second, that they are directly dependent upon relaxation of the recti muscles, and appear especially on bending over, lifting, coughing, sneezing and forcing at stool.

8. *Urogenital System.*—Owing to the reflex vomiting occurring so often in pain due to stones of the kidney, ureter and bladder and to dysmenorrhea, these conditions may be mistaken for gastralgia. A little attention to the source of such pain will exclude all but the right cause, and examination of the urogenital system will clear up the diagnosis.

9. *Peritoneum.*—For the sake of completeness I will merely mention the colic produced by inflammation of the peritoneum and accompanied by vomiting.

10. In conclusion, as is well known, we may have gastralgia accompany tabes dorsalis. Merely bearing in mind this possibility will often suggest the diagnosis.

The "crises gastriques et enteriques" occur paroxysmally every few months or years. Every case of periodical cramp of the stomach accompanied by vomiting makes us suspect tabes, and frequently these crises are the first symptom, followed only after two or three years by the complete picture. Usually, however, the complete picture is present at once.

Treatment is naturally most unsatisfactory and I confine myself to gastric lavage and giving morphine or oxalate of cerium.

This concludes my discussion of differential diagnosis. I do not add any histories, as every physician has had plenty of his own, though perhaps he has not always interpreted them rightly. I wish to emphasize once more the fact that there are three principal conditions to be considered in cases of gastralgia, or stomach cramp, namely, *spasm of the pylorus, biliary colic* and true *colic of the transverse colon.*

I trust I have proved it possible, even without the aid of the stomach tube, so to differentiate the various affections which can produce symptoms of gastralgia, that each may be treated clinically, in a rational manner.

The means of so doing, I repeat, are careful consideration of the history of each case, the time of occurrence of cardialgia, its duration, its relation to eating and defecation, its suppression by means of warmth, antacid remedies, etc., and the relation to it of secondary symptoms such as icterus, hematemesis, melena, and pains in certain regions.

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## RESECTION OF THE LEFT PELVIS FOR OSTEOSARCOMA.

BY M. STAMM, M.D.,
OF FREMONT, OHIO.

In the Medical News of March 14, 1903, I see that Prof. Keen, of Philadelphia, performed an operation for the removal of an osteosarcoma of the pelvis, where it was mentioned that a similar attempt had never been made before in this country. The following case was operated on May 15, 1901, and would, therefore, precede Dr. Keen's case nearly two years.

F. S., of Monroeville, O., age twenty-five years, barkeeper, was treated for rheumatism for about one year. About four months ago he began to notice a swelling above his left hip-joint at the upper portion of the sacro-iliac joint. I saw him about the beginning of May, the tumor appeared to be semi-elastic, veins enlarged, the skin showed

Fig. 1.

Osteosarcoma of Pelvis.

marks of overdistention. The tumor was about the size of a child's head, reaching from the sacrum to the hip-joint. After patient had seen some other surgeons and heard their gloomy prognosis, and after I had explained the great danger of such a formidable operation he insisted upon prompt interference and was willing to take any risk. The successful issue in one case operated upon by Prof. Kocher, in Bern, and one by Prof. Roux, in Lausanne, Switzerland, gave me some slight hope of a similar result, especially as patient seemed to be in fair health. The operation was undertaken on May 15, 1901, in the presence of Drs. McCormick and Phillips, of Fremont, Dr. Burt, of Norwalk, Drs. Kreider and Pritchard, of Monroeville, Dr. De la Barre, of Port Clinton, Dr. Heller, of Oak Harbor, and Durbin, of Woodville, O.

The incision was made from the sacro-iliac synchondrosis along the rim of the pelvis, down to the inferior iliac spine and to the hip-joint. The abdominal muscles were separated from the rim of the pelvis, the iliacus muscle was stripped off the ileum, the tensor vagina, sartorius and gluteus medius were also divided, Poupart's ligament separated and muscles pushed aside. Owing to the size of the tumor it was difficult to open the hip-joint and to remove the head of the femur with Gigli's saw. The joint proved to be healthy and could have been avoided if the tumor had not encroached upon its neighboring territory. The pelvis was divided about one inch in front of the hip-joint with saw and chisel through the ischium and horizontal ramus of the pubis. The chisel was used for the sacro-iliac synchondrosis and it showed that the tumor originated from its upper portion and was attached along the outside of the ileum to the periosteum, and its anterior pole worked itself between the gluteus medius and gluteus minimus. Hemorrhage was not very profuse, but the shock very great and was very much increased by the chiseling. Saline injections, subcutaneous and intravenous, as well as strychnine and camphorated oil did not make any impression and patient died about five hours after operation. From this case I have gained the impression that patients do not bear chiseling well and a saw driven by some motor would perhaps be the best way to separate the bones. I think that if the operation had been done in two sittings or if the resection of the hip-joint had been evaded the result might have been different.

Fig. 2.

Site of Operation.

## THE PALLIATIVE TREATMENT OF FIBROID TUMORS OF THE UTERUS.*

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The palliative measures in fibroid tumors of the uterus are to be classed as follows, viz.: 1. Oophorectomy. 2. Cutting off of the blood supply by obliteration of the uterine arteries. 3. Dilatation of the cervix with curettage of the endometrium. 4. Electricity. 5. Medication; including the administration of animal extracts.

In the light of later developments of modern surgery palliative treatment of fibroid tumors of the uterus is to be limited to the following conditions, viz.: (1) When some constitutional or local condition forbids removal of the growth; (2) when the patient declines operation; (3) when the growth is small and is not producing

* Read by request in the Section on Gynecology of the New York Academy of Medicine.

inconvenience, except when the abdomen is opened for some other purpose, in which case these growths should always be removed from the uterine wall when found whenever it is feasible; (4) in young women, when the possibility of removing the growth and leaving the uterus and ovaries behind cannot be definitely determined beforehand.

Oophorectomy as a palliative measure in these cases I have done only a few times and have limited it to women approaching the menopause who had small tumors that were producing intolerable symptoms, such as pain and hemorrhage, that resisted other measures including electricity and curettage. So far as I am now able to recall the results were fairly satisfactory and in two cases where the growths were small they disappeared.

In the class of tumors where this operation would be of benefit, viz., in small sessile or interstitial growths, it should be done as a matter of necessity rather than of choice when their removal is not practicable or the increased risk is not justifiable in individual cases.

Cystic and subperitoneal growths are not benefited by removal of the ovaries. The ovarian arteries should be obliterated when the ovaries are removed for this purpose.

The mortality of this operation is said by Roger Williams to be 10 per cent., but I fail to see how that is possible. The same author states also that it is of more benefit in young women with myomata of small size. I consider it positively unjustifiable in young women.

Cutting off the blood supply by obliteration of the uterine arteries has been productive of good when the growth is interstitial and it is small and is situated below the fundus. When done with the proper limitation it has in my hands produced marked reduction in the size of the tumor and in some instances complete disappearance; and there is always notable arrest of bleeding from the endometrium. To be effective, it is essential that the arteries on both sides should be permanently obliterated by applying two ligatures and dividing the vessels between them.

Dilatation of the cervix and curettage of the endometrium accomplishes a double purpose, viz.: First, and chiefly, arrest of hemorrhage, and, second, stimulation of the muscular fibers of the uterine wall to contraction whereby extrusion of the growth either towards the peritoneal side or into the cavity of the uterus is favored. Great care is necessary both in effecting dilatation and in using the curette in these cases lest rupture or laceration may result from the former or perforation through a very thin uterine wall may be caused by the latter. Gradual dilatation by means of sponge or laminaria tents is safer than rapid dilatation with the steel dilator and if the tent is protected by a rubber cover as I have directed elsewhere* the risk of sepsis is completely obviated.

Curettage should be done only with the dull instrument or one with copper edge and it should be as large as the canal will comfortably accommodate to lessen the chance of perforation of the uterine wall when it is thin. Following curettage the cavity should be freely irrigated with hot water or salt solution to remove loosened membrane and clots, and afterward with a solution of iodin in hot water. By using the compound tincture of iodine a perfectly clear solution is obtained in which there is no precipitate of iodine. The strength of this solution may be from half an ounce to an ounce to the pint. Iodine in its full strength should not be applied to the endometrium.

Electricity has been much abused and much misused in these cases. It is of undoubted benefit when used properly in appropriate conditions. (1) It will nearly always relieve the pain to a very considerable extent, though sometimes owing to the situation of the growth it does not afford relief. (2) It will arrest the hemorrhage when it is possible to reach all parts of the cavity of the uterus for contact with the electrode. In some instances, however, it is necessary to precede the application by dilatation and curettage to bring about a more prompt and decided result. (3) It will relieve in a measure congestion of the uterus and diminish the blood supply to the growth. (4) It will in suitable cases bring about very considerable reduction in the size of the growth. (5) When the growth is a true myoma of moderate size it will sometimes eventually disappear under prolonged applications of electricity to the endometrium. (6) It will sometimes facilitate extrusion of the tumor and thus favor its enucleation. (7) It will sometimes cause breaking down of the intervening wall between the growth and cavity of the uterus and expulsion of the tumor from the uterus. When such result is produced great care is necessary to obviate sepsis.

Electricity is then useful in many cases for relieving the symptoms produced by fibroid tumors of the uterus, but in some of these conditions (notably in subperitoneal and submucous growths) it is powerless to accomplish any good and should not be used. If it is to be applied with the intention to reduce the size of the tumor its use should be limited to small interstitial growths that have not developed so as to rise above the umbilicus. In growths of larger size than this even if they are interstitial, it is of little or no material benefit though sometimes it does relieve the pain to a very considerable extent. I am obliged to admit that the results obtained by electricity in these cases is not always permanent. I believe that it is only possible to obtain decided results by making the applications to or through the endometrium and thus more directly to the growth proper. The galvanic is the most useful current and the only one that will effect decided reduction in the size of these tumors. The faradic current is useful sometimes for relieving pain, as is also the static induced current.

Medication will sometimes prove a valuable

* "The Technic of Surgical Gynecology," p. 57, by the Author. International Journal of Surgery Co., New York, Publishers.

auxiliary to the palliative treatment of fibroids of the uterus. Ergot has been found useful in some instances. It acts, I think, by producing continuous contraction of the muscular wall surrounding the growth which causes diminution of the blood supply and favors extrusion of the mass.

The iodide and bromide of potassium are useful sedatives and afford much relief in some cases.

Arsenauro (bromide of gold and arsenic) exerts a marked effect in hemorrhagic cases. When given in full doses and continued persistently the bleeding is very materially lessened. It is also useful for counteracting the anemia caused by prolonged bleeding.

Extract of the thyroid and mammary glands are said to exert a decided action in these cases but my experience with them has been negative.

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## MEDICAL PROGRESS.

### MEDICINE.

**Hematogenous Miliary Tuberculosis of the Lungs.**—It has generally been believed that miliary tuberculosis of a hematogenous origin, was due to the deposit of the tubercle bacilli in the smaller capillaries of the lung, from which the process extended. Ribbert lately suggested, however, that the bacilli found their way from the pulmonary capillaries into the lymph channels and becoming collected in the lymphatic nodules, brought on pathological changes in the neighborhood of the latter. Experimental proof of this view has now been furnished by the researches of K. Sawada (Arch. f. klin. Med., Vol. 76, No. 4), who used very virulent cultures of human and bovine tubercle bacilli for injection in rabbits. Microscopical sections of the lungs showed that in each case the resulting miliary tuberculosis had its origin in the lymph nodules. The bacilli circulating in the blood, unless they are clumped in large masses, can not be caught in the comparatively large alveolar capillaries, and only become imprisoned when they find their way into the much narrower capillaries of the lymphatic nodules. A marked difference was found in the pictures presented by the lungs of young and adult rabbits, the signs of pulmonary disease appearing somewhat earlier in the adult than in the younger animals. This point the author believes, may have some value in explaining why pulmonary tuberculosis is less frequent in young children than other forms of tubercular lesions. In man the lymphatic nodules are not fully developed until the fifth to the seventh year. If the pulmonary involvement dominates the clinical picture of a case in the first five or six years of life, it may be assumed, judging from the author's experiments, that the infection resulted from the penetration of numerous and very virulent bacilli into the pulmonary circulation.

**Influence of Dwellings on Tuberculous Disease.**—Marburg is a small city in Germany of about 18,000 inhabitants and serves as a good example of conditions existing in other cities of a similar size. A study of these conditions as regards their influence on tuberculous disease has been made by Romberg and Haedicke (Arch. f. klin. Med., Vol. 76, No. 4). The proportion of the population suffering from pulmonary tuberculosis is 1.1 per cent., four-fifths of the deaths from the disease being found in the poorest quarter. Among the latter class, the number of phthisis cases was 4.7 per cent., whereas among the better situated class, the percentage was only 0.2 per cent. The distribution of the disease seemed also to be restricted to certain dwellings, 59.2 per cent. of the cases in the poorer quarters occurring in 33 per cent. of the houses of the lower class. It was found, however, that locality, mode of construction and the number of tenants had no apparent bearing on the number of cases of tuberculosis, nor did the latter appear to be influenced by the filth in the apartments. Direct infection seems to be the main factor in the spread of the disease. A single infection may not be followed by any pathological results, but the principal danger appears to lie in the continued association and contact with a phthisical subject amid filthy surroundings and who is careless regarding the disposition of his expectorations. This is the main reason why the disease is so often localized in particular dwellings and the fight against the disease must be conducted in the quarters of the poor, especial attention being paid to continued re-infection.

**Observations on the Blood in a Case of Extirpation of the Spleen.**—Some interesting observations have lately been made on the blood of a patient in whom the spleen was removed on account of rupture and laceration sustained by an accident, by R. Staehelin (Archiv. f. klin. Med., Vol. 76, No. 4). He compares his case with the 21 others which have been reported in the literature, and finds a number of points of difference, especially in the relation of the spleen to the blood constituents. In the larger number of cases there was reported a swelling of the lymphatic glands and this symptom was particularly marked in the author's case. In the cases where no enlargement was reported, it is not unlikely that it may have been present, but situated otherwise than in the peripheral glands. Another point which the author notes was the liability to infection which the patient presented, after the spleen had been removed. For some months the patient also experienced severe pains and weakness in the extremities, both femur and tibia being particularly sensitive to pressure. This may be ascribed to disturbances in the marrow of the long bones, for it is well known that the latter and also the spleen are the depositories of the broken down red cells. The blood examinations showed that at first the multinuclear neutrophiles were very much diminished, then increased perceptibly and finally sank to the normal numbers, this phenomenon corresponding, however, with the development and subsequent disappearance of an infectious process in the operative wound already noted. The lymphocytes, however, showed a marked increase which coincided with the swelling of the lymphglands and probably depended on a greater activity of the lymphatic apparatus during the presence of an infection. As far as the red cells are concerned, the spleen seems to have no effect whatever on their relative numbers. Its only influence is apparently on the lymphocytes. This increase may be explained by assuming that the spleen does not produce lymphocytes, but subserves some other function, which may be taken up by the lymphatic glands. This may be a production of or a change in some chemical body, or the absorption of the products of disintegrated blood. In this way the increase in the lymphocytes after splenectomy may be accounted for by the increased function of the lymphatic glands, the spleen not taking any part in the process. It seems, therefore, that the spleen has no function as a blood producing organ.

**Primary Cancer of the Pancreas.**—The principal interest of the case lies in the fact that notwithstanding the affection of the pancreas there was no glycosuria. Manouloff (Pract. Vratch., No. 23, 1903) diagnosed the case with comparative ease, as it presented all the symptoms of a malignant growth. He explains the ab-

sence of glycosuria by the complete destruction of the hepatic tissue. The patient was admitted to the hospital with general weakness and abdominal pain. The skin and the visible mucous membranes were markedly icteric. The abdomen large (34½ inches) and excessively tender; face and lower extremities edematous; marked arteriosclerosis (patient fifty years of age). The liver greatly enlarged, hard and very tender to touch. Annoying pruritus all over. Spleen enlarged. Nausea and constant pain in the region of the stomach; no vomiting. Urine contained some albumin, abundant biliary pigments, but no sugar. The feces colorless, with a strong odor, and a great quantity of fat corpuscles and undigested muscular fiber. Patient eats and drinks a great deal. After drawing off the ascites it became possible to detect in the linea alba under the left lobe of the liver a hard undulated swelling the size of a fist and hardly movable. The patient succumbed after nine months of suffering to extreme asthenia. Microscopically the pancreas was converted into a tumor with a strongly developed connective tissue stroma, containing in its fibers groups of parenchymatous elements of the new formation; these elements resembled polymorphous cylindrical epithelia surrounding cavities of various sizes, the whole looking much like a glandular swelling. Nothing remained of the pancreas. The liver was also greatly changed. It is of interest to note that while the head of the pancreas was attacked by the malignant growth, its body and tail underwent cystic degeneration, some of the cysts having reached a very large size. This combination of pathological processes in the pancreas has been observed quite frequently. Besides the liver the kidneys were also found to be the seat of a chronic interstitial nephritis, while the spleen showed marked hyperplasia due evidently to cirrhotic changes in the liver.

## SURGERY.

**Resection of the Clavicle.**—Three cases of partial and total resection of the clavicle are reported by P. Mauclaire (Trib. Méd., June 27, 1903), apropos of which he discusses the indications, technics and functional results of the operation. The indications for such a measure he holds to be comparatively rare; a partial resection having been performed in one of his cases for tuberculous osteitis and a second for comminuted fracture; a primary lymphosarcoma of the clavicle rendering extirpation of the bone necessary in a third. As to the technics of total extirpation, he describes two methods; one of which consists in disarticulation of the acromio-clavicular joint and severance of the attachments of the bone from without inward; in the second method the bone is resected at its mid point and the two fragments extirpated successively. The mortality of the operation is said to be practically nil; but in the extensive resections essential to the surgical treatment of neoplasms, the author emphasizes the necessity for the greatest care in approaching the internal extremity of the bone, as at this point entrance of air into a vein has been known to occur. Upon the integrity of the muscles inserted in the scapula, depends functional reestablishment after total extirpation; the former developing an active resistance which takes the place of the normal clavicular points of support; so that practically the normal range of movements is possible, as in partial or total congenital absence of the clavicle. A flattening of the shoulder is seen after such operations.

**Painful Affections of the Feet Among Trained Nurses.**—The liability of trained nurses to develop some static trouble with their feet during their term of hospital service is well known and is of considerable practical importance. R. W. Lovett (Jour. Am. Med. Ass'n, July 4, 1903) records the observations made during a period of eight years upon some 800 nurses in hospitals, all of which were examined on admission and suitable shoes or other treatment prescribed as demanded. The results obtained are very interesting. It was not possible to tell with certainty by examination whether or not the feet of an individual are likely to give trouble. The only reliable information was derived in these cases from imprints of the foot seen through glass, supported on a table over an aperture with a mirror underneath. A foot with a well distributed pressure area seems rather less likely to give trouble, than one resting on two islands. Other factors seem to be of little consequence, a flat foot may be perfectly serviceable as may also a severely pronated one, while an apparently well-balanced foot may become painful. The factors in causing the trouble among the nurses were to be sought rather in the general conditions than in any special conformation of the foot, following in many cases, illness and other conditions causing muscular debility. It occurred in most cases in from two to three months after admission and in the early spring, after the nurses had been indoors more and least often in the fall. The trouble was caused by a rolling in of the foot and a shifting inward of its weight bearing areas and not in any case observed by a breaking down or a lowering of the arch. The author believes that the use of a proper boot has done much to relieve the condition. The treatment consisted of the use of felt pads worn in the shoes during the day and the immersion of the feet at night in hot water followed by a cold shower and the application of a flannel bandage. In severer cases, a metal plate is worn in the shoe or a felt pad with adhesive straps which hold the foot in an inverted position. If no relief the patient is enjoined to keep off her feet and then begin to take long walks out of doors.

## HISTOLOGY, PATHOLOGY AND BACTERIOLOGY.

**Regarding Hemolysis in Experimental Infections.**—To the numerous contributions on the subject of bacterial hemolysins which have lately appeared, is added another by O. v. Wunschheim (Münch. Med. Woch., June 30, 1903). His researches were concerned with the question whether during the course of an infectious disease, the pathogenic microorganisms could cause the formation of hemolytic substances in the animal body and under what conditions. A large number of the lower animals were inoculated with cultures of various pathogenic bacteria, mostly of anthrax. The observations were made on centrifuged specimens, the color of the supernatant serum being noted in comparison with the normal. This seemed much simpler than taking a numerical count of the destroyed red cells. In the anthrax infections a sudden and intense hemoglobinemia was observed and the author proposes calling the purplish serum, "serum purpureum," to distinguish it from the minor grades of hemoglobinemia which were also found in other experiments. The author believes that similar processes also take place in the bodies of human beings, but are not recognized. A mild degree of hemoglobinemia may take place during the course of an infectious disease, without the production of a hemoglobinuria, and not be detected for lack of practical means of testing for it. Experiments are now in progress, from observations made in typhoid and influenza, to determine under what conditions, hemoglobinemia in infectious diseases is a constant factor, and whether the methods practised by the author can be made of clinical and prognostic value.

**Bactericidal Action of the Radium Rays.**—A preliminary communication in this subject is published by

R. PFEIFFER AND E. FRIEDBERGER (Berl. klin. Woch., July 13, 1903). A small quantity of radium bromid enclosed in a suitable rubber capsule, was placed some 2 or 3 inches away from a gelatin culture plate containing a large number of typhoid and cholera colonies. The experiments were conducted in a darkened room. The results even after 24 hours' exposure were negative. The distance was then decreased to ⅓ of an inch, and in 48 hours' time an area of about ⅔ of an inch in diameter was observed, in which no further growth took place. To determine whether this may not have been due to some change produced in the culture medium by the action of the rays, the sterile area was again inoculated with a fresh typhoid culture. An abundant growth was seen in 20 hours. Similar results were also obtained with cultures of cholera and anthrax. Whether there is an absolute death of the organisms or only prolonged interference with their development is still an undecided matter, but the authors believe there is a favorable field afforded in the treatment, especially of infectious processes of the skin, such as lupus and others.

**Pathology of Latent Malarial Infection.**—By the latent is meant a malaria which is not manifested by any symptoms and in which an examination of the blood does not necessarily show the presence of the malarial parasites. Pathological changes in the organs of these cases are only found at autopsy after death from some other disease. C. F. CRAIG (Am. Med., July 25, 1903) reports a series of seven cases of this character, three tertian and four æstivo-autumnal. In all these latent infections the pathological lesions were chiefly confined to the spleen and the liver, whereas in the acute infections it is known that almost every organ of the body is involved. The changes in the spleen consisted chiefly in an engorgement of the splenic sinuses with red cells and leucocytes, the presence of infected red cells and of phagocytes and of melaniferous leucocytes, an increase in the cells of the splenic pulp with more or less degeneration and karyokinesis and pigmentation of the organ confined to the edges of the Malpighian corpuscles and the splenic sinuses and trabeculæ. In the liver the changes consisted in slight pigmentation, more or less venous congestion, and the presence of melaniferous leucocytes. The changes in the æstivo-autumnal form differed but slightly and chiefly in the character of the parasites present. The chief point of value is that the parasites were found to undergo their entire normal human life cycle within the spleen, without being detected in the peripheral circulation or causing any evident symptoms. This also bears out the old theory that the spleen is the seat of the malarial infection. In any one of these cases, puncture of the spleen would have resulted in a diagnosis, but the author is of the opinion that this procedure is too dangerous even in experienced hands and not to be advised as a routine measure or in cases such as these where no malarial symptoms are present.

**A Cavernous Tumor of the Spinal Cord.**—An instance of this hitherto unreported condition is published by R. HADLICH (Virchow's Arch., Vol. 172, No. 3), and its relations to the newer theories regarding the origin of cavernous tumors discussed. The specimen was secured from a patient who had died two days after Cesarean section had been performed on account of a narrow pelvis. At no time had there been any symptoms referable to the tumor which was as large as a pea and occupied a position on the dorsal aspect of the lumbar section. A cross section showed marked disturbances in the relations of the various parts, and in the region of the posterior horns, were numerous cavities of larger and smaller size, which apparently originated in the neighborhood of the posterior nerve roots and extended towards the center and the anterior horns. Most of these canals were found to contain blood and were lined by a single layer of endothelium. The only analogous cases are those of a cavernous tumor of the liver, of which numerous cases have been reported and theories as to their origin proposed. The author is unable to relate his own case to any of these and comes to no definite conclusions as to its etiology.

**Staining Elastic Fibres.**—A new method by which it is possible to stain both elastic fibres and fat at the same time, is proposed by B. FISCHER (Virchow's Arch., Vol. 172, No. 3). Such a procedure is of especial value in the examination of areas of fatty degeneration in vessels, kidneys, lungs, etc. To 74 cc. of fuchselin there is added 26 cc. of distilled water and the mixture brought to a boil. An excess of scarlet R. or sudan III is added and the mass allowed to cool. The section does not come in contact with ordinary alcohol in any form, which would dissolve out some of the fat, but the differentiation is accomplished with a hot saturated solution of scarlet R. or sudan III, in 70 per cent. alcohol. The latter solution does not affect the fat. The sections are first placed in the fuchselin mixture for one hour and then for fifteen minutes in the hot alcoholic scarlet or sudan solution. They are then washed in water and mounted in glycerin. It is not advisable as a rule to combine with this any nuclear stain on account of the multiplicity of colors, but if desired, the sections may be placed in acetic acid-methyl green solution and then differentiated in acidulated water. If care is taken, the nuclei appear of a delicate pale green color.

**The Formation of Gall-stones.**—With the endeavor to throw some light on the formation of gall-stones, V. HARLEY and W. BARRATT (Jour. of Physiol., June 15, 1903) observed the effect of introducing cholesterin calculi or fragments of calculi into the gall-bladder of dogs, both in health and in various morbid states. A series of five experiments all gave results similar to the following experiment: Two cholesterin fragments were introduced into the gall-bladder; the dog was killed 265 days later and necropsy performed. Both gall-stone fragments had disappeared; the gall-bladder, cystic duct and bile were all healthy in aspect. All the animals had remained in good health except one, which lost weight. In a second series of experiments, besides the calculi, dry pus or pus containing the *Bacillus coli* was introduced. The dogs remained in apparently perfect health, nevertheless the autopsy revealed cholecystitis and no dissolution of gall-stones occurred. In two experiments where only gall-stones were introduced, the latter were found unaltered, but cholecystitis was present and bacilli were found in the contents of the gall-bladder. It would therefore appear that when the gall-bladder is healthy the gall-stones seemed to disappear; on the other hand where cholecystitis was present the gall-stones remained unchanged. In the second series of cases the following changes were met with: The columnar epithelium of the mucous membrane of the gall-bladder was in every case covered with an amorphous or finely reticulated deposit, which could not be well stained with a fibrin stain nor with any of the other stains employed. Sometimes this deposit contained micro-organisms. The epithelial cells themselves were swollen and presented in the middle and upper part of their cytoplasm a clear vacuolated aspect. Lying among the epithelial cells, wandering cells could also be seen in sparse numbers. The connective tissue of the mucous coat sometimes appeared wide-meshed as if edematous and the capillaries of the mucous membrane were sometimes congested.

## OBSTETRICS AND GYNECOLOGY.

**Maternal and Fetal Temperatures.**—The temperature of the child at birth is stated by most observers to be about the same as that of the mother, or a little higher. In 33 births S. G. CHAMPION (Brit. Jour. of Obstet., June, 1903) made examinations of both the fetal and maternal temperatures and came to the following conclusions: The temperature of the fetus in utero is higher than that of the mother. The exact amount of disparity it is impossible to determine, because during the process of expulsion of the child its temperature is already beginning to fall, the result of loss by heat radiation by the skin; immediately after birth the rectal temperature of the child still shows an average excess of 1.0° F. over that of the mother. The raised temperature never persists, but immediately and rapidly falls in the next fifteen to twenty minutes. The heat loss must have undoubtedly occurred by the skin and from the lungs. In no case was a bath administered to the child until after the observations were concluded.

**Injuries to the Child's Head During Delivery.**—In ordinary practice, depressions of the skull caused during parturition are not very common; as a rule, ROBERT JARDINE (Brit. Jour. of Obstet., June, 1903) found that they occurred in contracted pelves, and are caused by pressure of the promontory, but they may occur in normal pelves. Fracture may occur during delivery and yet there may be no depression evident at a casual examination. Besides injuries to the bones other serious injuries may arise, such as cortical or meningeal hemorrhage, traumatic keratitis, hemorrhage into the optic nerve, or anterior chamber of the eye. Subconjunctival hemorrhages are exceedingly common even in normal labors, but they are of no consequence. If cortical and meningeal hemorrhages do not cause death there is liability of permanent injury to the brain. Very little can be done in hemorrhages but to leave them to nature. If there is fracture, a trephine might be used, but in some cases where there is no fracture or depression it is difficult, and, at times, impossible, to locate the hemorrhage. In high forceps deliveries one blade of the instrument usually lies over or near one of the eyes, and occasionally the eye is more or less injured. In difficult deliveries the eye may be enucleated. Hemorrhage into the anterior chamber is occasionally seen. Retinal and hemorrhages into optic nerve may also occur. There may be a condition which Ernest W. Thomson calls "traumatic keratitis in the newborn." The author recalls one case of his own in which the child had been delivered with axis traction forceps and twenty-four hours later one cornea was more or less opaque.

**Uterine Pregnancy Following Operation for Extra-uterine Gestation.**—The fact that a woman who has recovered from an operation for extra-uterine pregnancy is liable to a similar accident is in the proportion of one to four, makes F. D. DONOGHUE (Am. Jour. of Obstet., July, 1903) report two cases of normal pregnancy following operation for extra-uterine gestation. One occurred after a vaginal operation, while the other had been preceded by an abdominal operation. The causes of extra-uterine gestation group themselves naturally into (1) cases in which the tube is ruptured or aborted, and (2) those cases diagnosed before rupture. The first group also divides into cases of pelvic or broad ligament hematocele, and free hemorrhage into the abdominal cavity. If one is going to be conservative in operating upon extra-uterine pregnancy, that is, leave in the tubes and ovaries, with a view to subsequent normal pregnancy, the author believes that the patient or the patient's relatives should be consulted as to their wishes in the matter, provided they have been previously warned of the probability of the occurrence of a second extra-uterine pregnancy. All such cases should be carefully watched after the operation. As with an increasing number of reported cases, normal pregnancy, it appears, is much more apt to occur than a repetition of an extra-uterine. Thus it would seem that one is justified in being conservative in operative procedure; but careful watch should be kept for the slightest deviation for a normal menstruation following the operation.

**Placenta Previa.**—Of all the complications that the obstetrician has to contend with there is none that is fraught with more danger or attended with greater anxiety than this condition, save, perhaps, eclampsia. If complications cause placenta previa to result in a high maternal mortality. JOHN F. MORAN (Am. Jour. of Obstet., July, 1903) finds that this is somewhere between 1 in 300 and 1 in 1,000. Placenta previa is seven times more frequent in multiparæ than in primiparæ. In 5,000 births at the Columbia Hospital, Washington, D. C., it has occurred 16 times or once in 312.5 births. Of these there was one maternal fatality and six infants were lost. The author has collected from literature 16 cases by 13 operators, where Cæsarean section has been performed for placenta previa. Five mothers died, or 31.5 per cent., and four infants were lost, or 25 per cent. Eleven children were delivered alive. Seven were done after the Sänger method; eight were of the Porro variety; one unknown. In lateral placenta previa there is rarely any difficulty, and labor usually terminates naturally. In the marginal, however, it becomes more dangerous and the central variety is always a matter of gravest concern. Hemorrhage and sepsis are the most important dangers in all cases of previa, and to these rupture of the uterus may be added as a third factor in accouchement forcé and more particularly where an attempt is made to deliver the child through an insufficiently dilated cervix. Regarding the absolute indications for Cæsarean section in placenta previa, statistics are not very encouraging, but usually it has been performed for repeated hemorrhages where and after other methods of intervention have failed. Whether these results will improve will depend upon a more thorough study of the cases during pregnancy, early recognition and prompt action while the patient is in good condition.

**Cervical Incisions in Labor.**—The use of this procedure is by no means a new obstetric finding, says R. W. HOLMES (Am. Jour. of Obstet., July, 1903), for a century or more, cutting operations upon unyielding cervices have been fully recognized. It is applicable and indicated after effacement of the cervix has taken place. In contributory indications their use is a moot question; the judgment of the operator must decide in individual cases. For this reason incisions are especially applicable in primiparæ, and often contra-indicated in multiparæ. Manual dilation previous to incisions does not secure the best conditions for the incision. Incisions are potentially dangerous; the dangers comprise infection, hemorrhage, and extensive lacerations beyond the vaginal vault. The use of incisions demands an obstetric armamentarium, assistants, and a definite experience in obstetric procedures. The details of the technic may be modified to suit the taste of the operator. The minimum number of incisions should be made to meet the exigencies of the case. Oblique incisions can be proven to be more advantageous as regards the after-effects than the usual quadrant cuts. In the absence of hemorrhage or accessory lacerations, it is a moot question whether or not the incisions should be sewed up. Immediate delivery should follow the incisions in every instance.

**The Bossi Dilator.**—The principle claimed for this instrument is that a constant elastic pressure upon the cervix will dilate it evenly and safely, even though great

force is employed. The last model that Bossi has produced is simply a four-branched uterine dilator with a strong screw on the handle and an indicator to show the amount of dilatation. Numerous dilators have recently been put on the market, and they all embody the same principle as the dilator of Bossi, and vary only as to detail of mechanical construction. J. B. DE LEE (Am. Jour. of Obstet., July, 1903) cites the following as the result of its application on three cases and a study of those to be found in the literature: (1) There is a small field of usefulness for the instrument in cases where rapid delivery by dilatation of the cervix is necessary after effacement. Before effacement, the colpeurynter should be used. It will be more successful in multiparæ. (2) The instrument would be useful in dilating the cervix in those cases where manual dilatation would be successful. It possesses advantages over the hand in asepsis, and that it is not tiring, so that the operator may carry out the subsequent delivery with comfort. (3) The instrument is not safe, but requires careful and skilful watchfulness, and one must search for and be ready to repair more or less extensive lacerations. These are greater in primiparæ. (4) It should never be used in placenta previa. (5) It does not replace the colpeurynter, the use of the hand, or cervical incisions in all cases.

**Abdominal and Vaginal Cæsarean Section.**—These most fortunately, are very rarely indicated for accouchement forcé. J. C. WEBSTER (Am. Jour. Obstet., July, 1903) finds that it was Acconi in 1895, who first performed vaginal Cæsarean section for the purpose of rapidly delivering the child, but that it was mainly due to Dührssen's advocacy that it has now begun to attract notice. When an eclamptic dies, the fetus being alive in utero, it is the duty of a physician who may be present, at the time of death, to advise immediate post-mortem Cæsarean section. Bauer has recently reported eight cases in which four of the infants were saved. Within the last few years, abdominal Cæsarean section has been carried out in placenta previa. It was first suggested by Lawson Tait. It must, indeed, be considered as rarely indicated in this condition, practically only when some condition exists which renders the other means or methods extremely hazardous or impossible. The writer has reported one case of a young girl of fourteen, in which excessive hemorrhage associated with a small vagina and a contracted pelvis necessitated the operation. Cæsarean section has been rarely employed in cases where there had been a premature detachment of a normally situated placenta though certain authorities so advise its use. Vaginal Cæsarean section is indicated in cases of accidental hemorrhages where the patient's condition is critical and where the cervix cannot be rapidly dilated by ordinary methods, provided a competent operator is at hand. It is indicated in affections of the heart, lungs, kidney, etc., where the mother is in danger and rapid delivery is indicated. In these various conditions, it is well to do vaginal section where the cervix does not admit of easy dilatation. The abdominal operation should not be employed save where there is no possibility of employing vaginal section in a satisfactory manner. It is indicated where the mother is in articulo mortis. The abdominal operation is by far the simplest and quickest in such cases, for it can be performed merely with a knife and without assistance. The vaginal operation has been advised but it would take longer and assistance would be required.

**Rupture of the Uterus During Labor.**—The patient was a VIII-para who had been 1½ days in labor when BARANOFF (Prakt. Vratch, No. 24, 1903) was called to see her. The pains which had been quite strong during the first twenty-four hours suddenly ceased after sharp, sudden pain in the lower part of the abdomen. This was accompanied by some hemorrhage. The patient was found sitting in bed, with pale face and cold extremities, complaining of very great fatigue; pulse 80, regular but weak. Examination revealed a rupture of the body just above the cervix uteri, the fetus in the abdominal cavity, which was also full of blood clots. As the conditions surrounding the patient were such as to preclude any possibility of a laparotomy, a careful extraction of the fetus, preceded by a cautiously performed version, through the formed rent was accomplished without any special difficulty except as to the extraction of the after-coming head with the extended arms. The fetus was dead. Many of the blood clots were extracted by the hand. The patient stood the operation well (no chloroform, simply hypodermic injection of morphine), and suffered from almost no hemorrhage. The placenta was removed without difficulty. The site of the rupture was tamponed for twenty-four hours. The course of recovery was quite uneventful, and in six weeks the woman was able to walk about. The author examined the patient six months after delivery and found her perfectly well; no pains in the lower part of the abdomen; uterus somewhat enlarged, but painless; the body of the uterus flexed laterally, the cervix to the left and high. The first menstruation took place six months after confinement, and is at present quite regular.

**Effects of Toxemia of Pregnancy upon the Cardiovascular System.**—Post-mortem lesions have been found in almost every organ in eclampsia. Thus punctate hemorrhages and areas of cellular necrosis found in the liver, the liver cell emboli, the thromboses, and emboli of giant cells, the dissolution of the blood and the destructive effects upon the blood vessel walls, the areas of gangrenous pneumonia found in the lungs, the hemorrhagic foci in the brain, and most constant of all lesions—the various pathological changes so frequently found in the kidneys—emphasize the fact, says RICHARD C. NORRIS (Am. Jour. of Obstet., July, 1903), that eclampsia cannot be attributed to any cause manifesting its destructive force on any one organ, but on a number of organs, with toxemia as an important factor in the etiology of that disease. One of the most valuable signs of a threatening outburst of eclampsia is a change in the tension and rapidity of the pulse. It may be presumed that when toxins have accumulated in sufficient strength to produce their first effect, that of irritation, the vasoconstrictor nerves are stimulated and a high tension pulse follows. When the accumulated poisons are finally sufficient to overwhelm the patient, the pulse tension falls, and wholly disappears in a fatal case. It is a well-known fact that when pregnancy is complicated by organic heart disease, the appearance of toxemia renders the prognosis for the heart lesion more grave, since there are such widespread changes induced by toxins, it must not be expected that the heart muscles will escape. There is no doubt in the writer's mind but that some cases of sudden death after labor can be explained by unrecognized toxemia originating during pregnancy and suddenly declaring itself by what the author calls "cardiac eclampsia."

**Cysts of the Round Ligament.**—The origin of cysts in this locality is, according to A. BROTHERS (Am. Jour of Obstet., July, 1903), ordinarily attributed to a persistence of the canal of Nuck. A serous cyst is formed by the gravitation of serum from the peritoneal cavity, through the open canal of Nuck in the direction of the labium majus. As the opening at the internal abdominal ring may be patent or shut off, two varieties of liquid accumulations may result—the one being a reducible, the other an isolated collection of liquid, *i.e.*, a cyst. Weber suggested that as the gubernaculum

of Hunter, which becomes the round ligament in the female, is at first hollow, and there might be a persistence of this fetal condition favoring a pathological growth. The occasional association of these liquid collections in the inguinal region with hernia has been made use of to explain the pathogenesis of these cysts of the round ligament. While a few observations have been made to sustain this view, the majority of cases point in the other direction. So that the simultaneous existence of hernia must be regarded as an occasional coincidence. These cysts of the canal of Nuck usually occur during the child-bearing period, especially between the years of thirty and fifty. The sac is lined with a single layer of epithelium (pavement) and may sometimes show muscular fibers. The tumor develops in contact with the round ligament which is usually behind it. It may have a pedicle extending to the inguinal canal which may be patent and communicate with the peritoneal cavity. The diagnosis is sometimes quite difficult because, if the cyst be tense, it may closely simulate a solid tumor. It would probably be most often mistaken for a hernia. Tympanitic percussion rate and irreducibility, excepting in strangulated or incarcerated cases, will usually exclude this condition. The presence of fluctuation and dulness on percussion, with an absence of pain and interference with the normal function of the bowels ought to make the diagnosis fairly easy. With active inflammation going on the diagnosis is not so easy, as under such circumstances many of these cases have been mistaken for incarcerated hernia. The treatment of these cases formerly consisted of puncture with the subsequent injection of irritating chemicals, such as tincture of iodine. Inasmuch as there may be a communication with the abdominal cavity at the internal abdominal ring this method of treatment is obviously associated with grave risks. In our present state of surgical science it is far safer to dissect out the cyst and to properly tie off the pedicle whether open or closed.

**The Breasts and Genitalia.**—Though the breast, the characteristic organ of mammalian animals, is anatomically and developmentally an appendage of the skin, still it is reasonable to consider it as part of the genital organs. As generally known, the breasts undergo great changes during gestation, the greatest degree of development in the time subsequent to parturition. It is a notewothy fact to which the attention of physicians has not as yet been drawn, and to the importance of which Ralph Temesvary (Brit. Jour. of Obstet., June, 1903) refers, that the death of the fetus during pregnancy without its expulsion from the uterus, such symptoms occur in the breasts as arise after delivery; the breasts become still more full and hard, and instead of colostrum they secrete real milk. These conditions rapidly recede and in a few days the breasts return to a state identical with that preceding gestation. From this change in the breasts, even Hippocrates inferred the death of the fetus in utero or impending miscarriage. Breast hypertrophy commences its evolution either at the period of puberty, simultaneously with the first menstruation, or during the first pregnancy; it is likewise in causal relation with the functions of the genital organs. Routh reports a case in a virgin where the breasts were hypertrophied as a result of masturbation. Regarding the new growths of the breasts, Lücke was the first who drew our attention to the fact that they sometimes occur during pregnancy, or if they have been present previously, then they commence to grow more rapidly. Cases have been observed in which women suffering from secondary amenorrhea had uterine hemorrhage in consequence of the irritation of the skin of the breasts. The sucking of the nipples during pregnancy may lead to uterine contractions and even produce abortion. Scanzoni has brought this result about by applying to the nipples a cupping instrument supplied with a rubber tube for suction, twice or thrice daily for two to three hours. In women suckling their babies involution takes place much more rapidly than if the child is weaned at birth. Indeed, if the child is suckled too long, the uterus may take on an hyperinvolution, or "lactation atrophy." This condition usually passes off after the child is weaned. In new growths of the breasts, particularly in cancer, not infrequently a secondary amenorrhea ensues. There may also be interruption of pregnancy. As to the nervous connection, first of all it may be mentioned that the lacteal glands are supplied with three kinds of nerves: sensory, vasomotor and motor nerves; these originate partly in cerebrospinal centers. Thus the lacteal glands stand in connection with the genital organs supplied with nerves coming partly from the sympathetic nervous system and partly from the cerebrospinal centers. The experiments of Mironow and Ribbert prove also that, not even the blood vessels form an indispensable path of communication between the breasts and the female genitalia, although the connection itself exists. Another way remains, and that is the presence of some substance secreted by the ovaries, which substance circulating in the blood of the suckling or pregnant female gives origin under certain circumstances to the secretion of milk. The writer holds this theory and further, that the blood circulation, the quantity of the blood flowing to the breasts, being influenced by the nervous system, plays only a secondary rôle. In the reverse direction the stimulus is chiefly produced by the nervous system, and the blood circulation here plays a secondary part in the form of a reflex hyperemia. In all these cases a certain outer stimulus, acting by way of the vasomotor nerves of the lacteal gland, causes milk secretion. Such stimuli are: attempts at suckling by infants, adults and animals; stimulating applications to the breasts, such as energetic counter-irritation, sinapisms, and vesicants.

**Congenital Absence of the Uterus and Atresia of the Vagina.**—In the case described by Dombrowsky (Prak. Vratch. No. 23, 1903) there was no other abnormality. The mammary glands were of normal size and form, well developed with normally pigmented areolæ. Mons veneris and labia majora well covered with hair. But the labia minora hardly developed at all; from the middle of the vestibule they gradually merge into the mucous membrane at the introitus vaginæ. Clitoris and meatus urethræ normal. In attempting to introduce the finger it meets a tough muscular partition which forms as it were a sort of a pocket that contracts over the finger, but presents no opening anywhere. This evidently served in coitus the purpose of an artificial vagina. The examination per vaginam failed to detect anything like a uterus, while bimanually both hands meet without the intervention of any body. Per rectum author succeeded in palpating a small roundish body of irregular form, easily movable and not tender to pressure or manipulation. The woman was twenty-one years of age, and has never menstruated, before or after marriage. As coitus was normal and painless whatever surgical interference might be indicated was not called for.

## NEUROLOGY AND PSYCHIATRY.

**Two Cases of Sarcoma of the Spinal Cord.**—Tumors of the cord, until recently cavities inaccessible to treatment, have of late excited considerable interest. Senator (Prakt. Vratch., No. 24, 1903) presents two highly instructive cases. In one case, that of a woman,

sixty-nine years of age, there was a history of ten months' duration, that began with a sensation of formication in the toes and pains in the feet; to this was later added inability to flex the knees, burning and pains in the soles which spread upward to the hip-joint. During the last six months patient lost all power of locomotion, suffered from convulsive twitching in the lower extremity, at times so pronounced and painful that the knees were forcibly flexed over the chest. There was also retention of urine. Patient lies recumbent on the back and is unable to move the lower extremities. Passive movements also hardly possible. Knee reflexes very much exaggerated. Babinski's sign present. Percussion of the muscles calls out painful twitchings. Stroking of the soles or legs is attended with clonic contractions of the lower extremities and of the abdominal muscles. Abdominal reflexes absent. Sensation lowered in the lower extremities. This condition grew gradually worse until the sensation of pain and temperature entirely disappeared, while that of touch disappeared over a still greater area extending upward. Late in the disease there occurred curvature of the spine at the third lumbar vertebra. In the course of the disease the body of the patient grew, as it were, shorter, the chest approached the pelvis. The abdominal muscles were almost in a continual state of contraction. Dyspnea and attacks of tightness in the chest, Cheyne-Stokes' respiration and marked slowness of the breath (8 per minute) supervened. Lumbar puncture during the early period of the disease brought forth 10 to 12 cc. of a limpid liquid with but little albumin. After the second puncture 5 c.c. of one-half-per-cent. solution of cocaine was introduced into the subdural space with remarkable improvement in the contractures and pain which lasted for three hours. Of the drugs employed scopolamine (hyoscine) seems to have given the best results. The autopsy revealed a tumor of the dura mater, which was macroscopically seen to be a sarcoma. The second patient was admitted to the hospital with pains in the back, inability to move the legs and complaining of tormenting thirst. The trouble began seven months before with pains in the back, between the scapulæ, which would at times become so severe as to render her unable to work. Some four weeks before admission the soles began to swell; this was followed by swelling of the abdomen, while two weeks before patient became unable to move the left leg. There is no retention of either urine or feces. Patient recumbent on the back, indifferent, consciousness slightly impaired. Knee reflexes exaggerated, Babinski's sign present, and ankle clonus indistinct. It is rather difficult to pick up the patient, as the spinal column is quite stiff. Patient complains especially of pains in the legs. Autopsy (patient died on the third day after admission to the hospital) gave the following: the heart slightly hypertrophied, lungs somewhat adherent, the thyroid gland hypertrophied, full of cysts; the bladder distended, its mucous membrane covered with necrotic spots; ovaries thickened. The vessels of the brain markedly calcified, the spinal column much congested, in the region of the third and fourth thoracic vertebræ to the left there is seen a hard swelling, which is macroscopically a fibrosarcoma. The interesting feature of this case is the very rapid course of the disease. The first stage, what the author calls the stage of neuralgia, was quite short, while the stage of paraplegia that usually occupies months and years, was hardly extended over two weeks.

**Chorea in Pregnancy.**—It has often been observed that the movements of a choreic patient are closely akin to those normally employed in the expression of emotions. In a young child, before the highest centers have developed co-ordinating control, such movements are alone present; it is only by a process of education that spontaneous movements of early infancy become coordinated, and thus capable of purposive action, says Cecil Wall (Brit. Jour. of Obstet., June, 1903). Rheumatism is undoubtedly, in the majority of cases, associated in some way with the chorea of childhood. So, too, during pregnancy, rheumatism plays an important part in the etiology of chorea. Buist found a personal history of rheumatism in 45 out of the 226 cases that he analyzed. The author's statistics show that at least 16 of 37 patients had previously suffered from some form of rheumatism. Twelve more had had chorea in childhood without other rheumatic manifestations. Antecedent chorea may suggest a rheumatic taint, but cannot be taken as conclusive evidence. In pregnancy, defective mental development seems to vie with rheumatism and previous chorea as one of the predisposing factors rendering a patient liable to an attack of chorea. The determining cause for chorea is not infrequently to be found in worry, for which the pregnancy is the chief cause; in case the patient is worried by the knowledge that her child is illegitimate. Fear of dystocia may be another inciting factor. Chorea in pregnancy seems to be determined by mental display, overstrain and shock. Secondly, the determining cause is only effectual when it acts upon a brain whose power of control is somewhat lowered by the pregnant state, and in addition is unstable in consequence of (1) antecedent chorea; (2) antecedent rheumatism or a similar debilitating condition; (3) a defect in development.

## PHYSIOLOGY.

**Influence of the Auricles on Cardiac Percussion.**—No systematic attempt has been made to ascertain the effect of the enlargement of one auricle upon the other or upon the heart as a whole, and the part they play in modifying the percussion boundaries has been generally lost sight of. With this point in view, D. R. Patterson (Bristol Med. Chir. Jour., June, 1903) has examined a large number of frozen sections in dogs and also a case of mitral disease in a human subject, and found that the auricles play a not unimportant part in modifying the relations of the heart. The investigations go to show that, while enlargement of the left auricle may take place to some extent downward, and possibly slightly upward, the chief increase is undoubtedly in an anteroposterior direction. This carries the heart forward and tends to influence the precordial area of dulness.

**The Gastric Secretion of the Newborn.**—The researches of O. Cohnheim and F. Soetbeer (Hoppe-Seyler's Zeitsch. f. Physiol. Chemie, Vol. 37, Nos. 5 and 6) show that in dogs no more than one day old, there is an active gastric juice containing free hydrochloric acid, pepsin and rennin. This secretion is reflexly accelerated by the act of sucking, independent of the presence of milk in the stomach. The authors were unable to determine whether any gastric juice is present in the pup's stomach before it has begun to suck or not. There are two facts of marked significance connected with the above results, namely: (1) The gastric juice of the nursling contains at the very earliest stage free hydrochloric acid and not lactic acid, as has been maintained; (2) The nervous mechanism controlling the secretion of gastric juice is at the outset of life an inherited reflex, initiated by the act of sucking.

**Compressed Air and Respiration.**—As the results of a series of experiments on mice, L. Hill and J. J. R. Macleod (Jour. of Physiol, June 16, 1903) found that compressed air at a pressure of +4 atmospheres and upward markedly diminishes the $CO_2$ output, very greatly lessens the $H_2O$ output and increases the loss of body heat. The lessened $CO_2$ output is due to the

high partial pressure of oxygen, which arrests the oxidative processes in the tissues. A partial pressure of 100 per cent. atmosphere of oxygen has this effect and the effect increases with the partial pressure. The $H_2O$ output is arrested because moist air when compressed becomes saturated with water vapor, compressed air delays evaporation by hindering the diffusion of water vapor and the escape of water vapor per liter during ventilation varies inversely as the pressure in the chamber. The loss in body heat is due to the increased conductivity of dry compressed air and of air saturated with water vapor. Wet air at one atmosphere and 20° C. increases tissue combustion in mice by increasing the loss of heat. The loss may be greater than the gain, so that the mice are cooled and may even die when long exposed to a current of wet air at temperatures below 20° C.

**The Functional Changes of Mammalian Muscle in Asphyxia.**—This frequently investigated theme acquires new interest at the hands of C. LHOTAK v. LHOTA (Pflüger's Archiv f. Physiol., Vol. 94, Nos. 11 and 12). He found that poverty of oxygen rapidly lowers the working power of mammalian muscle, sometimes to the zero point. A similar diminution of irritability also occurs if the muscle during asphyxia is at rest. The reduction of working capacity is at any rate transitory, for a muscle is capable of performing a long series of contractions for a long time after the cessation of heart-action. It thus appears that ability to manifest energy recovers spontaneously to a certain degree, which recovery can be hastened by mechanical stimuli and particularly by a renewed supply of oxygenated blood. By the latter means the asphyxiated muscle can attain its original power of contractibility. In the muscles of weak, lean animals and even after repeated asphyxiation, there appears to be little or no diminution of functional capacity.

**The Intestinal Absorption of Iron.**—The rule that in the intestine compounds soluble in lipoids undergo intra-epithelial absorption, while compounds insoluble in lipoids undergo inter-epithelial absorption, finds, according to R. HÖBER (Pflüger's Archiv f. Physiol, Vol. 94, Nos. 5 and 6), an exception in the case of iron. Starting out with the supposition that it is not an iron salt that enters the intestine and undergoes absorption there, but some iron compound formed in the stomach by union with albumin or albuminous decomposition product, which compound is soluble in lipoids, and hence, on this hypothesis the presence of iron in the epithelial cells would be explained, the author tried to discover if any other metallic salts which react with albumin or its derivatives similarly to iron, are absorbed intra-epithelially. This was found not to be the case. Neither salts of silver, mercury, lead, bismuth, copper, cobalt, nickel, nor manganese can be discovered in the intestinal epithelial cells; they are evidently slowly absorbed inter-epithelially as salts insoluble in lipoids. It thus appears that there are special provisions in the intestine for the absorption of iron.

**Lactic Acid Fermentation.**—For a long time engaged in the inquiry as to the real extent to which fermentative processes may be distinct from the life of cells, R. O. HERZOG (Hoppe-Seyler's Zeitsch. f. Physiol. Chemie, Vol. 37, Nos. 5 and 6) at last succeeded in obtaining from a culture of lactic acid bacteria, a powder which is capable of converting milk sugar into lactic acid. The reaction is a very slow one and the quantity of lactic acid produced is so small that it can be detected only by microchemical means.

**The Mechanism of Phloridzin Glycosuria.**—In confirmation of the results of Zuntz, F. W. PAVY, T. G. BRODIE and R. L. SIAU (Jour. of Physiol., June 16, 1903) found that the injection of phloridzin into the renal artery of one side produced glycosuria from the corresponding kidney prior to and to a greater extent than from the other. The perfusion of a surviving kidney with blood containing phloridzin, produced a diuresis accompanied with the presence in the urine of a notable amount of sugar, which is not to be accounted for by the disappearance of sugar that occurs from the blood. The intravenous injection of phloridzin produces glycosuria after ablation of the abdominal viscera (necessarily the kidneys excepted), and the elimination of sugar persists after the blood sugar has fallen to the lowest level that is noticed to occur. The sugar excreted under these circumstances may far exceed that existing in the circulating blood. The fall in sugar observed after simple ablation of the viscera undergoes no variation with the supplemented administration of phloridzin, notwithstanding the associated glycosuria. The hitherto proposed theories of phloridzin action fail to meet the requirements of the conditions existing. Under the view propounded by the authors, the glycosuria effected by phloridzin, is attributable to a special action exerted upon the cells of the renal tubules by which they acquire the power of producing sugar. They believe that under the influence of the presence of phloridzin, these cells exert a catabolic action upon something reaching them from the blood, resulting in the liberation of dextrose in a manner comparable to that by which lactose is set free by the cells of the mammary gland.

**The Rôle of the Liver and Spleen in the Destruction of Blood Corpuscles.**—A series of experiments were undertaken by W. BAIN (Jour. of Physiol., June 15, 1903), for the purpose of determining the changes which occur in the blood when it is passed repeatedly through the liver and through the spleen, and then of determining the influence of these organs upon the blood corpuscles. In a series of survival experments on the liver and spleen, it is shown that these organs retain the power of destroying the red and white corpuscles of the blood. The action of the liver is mainly one upon the red corpuscles, those poor in hemoglobin being the ones chiefly affected, a fact proved by the increased hemoglobin value of the corpuscles after perfusion. Of the hemoglobin set free, most is retained by the liver and further destroyed, since the loosely combined iron of the liver, as determined by the ammonium sulphide test, is largely increased after perfusion; since the amount of iron in the dried liver rises from .14 per cent to .26 per cent., and since the liver secretes a considerable quantity of bile rich in pigment during the course of the experiment. The main action of the spleen is upon the leucocytes, which are largely destroyed by it during the perfusion. The variety chiefly affected is the polymorphonuclear. The spleen in addition destroys a small percentage of red corpuscles, since their numbers are diminished, their hemoglobin value increased, and loosely combined iron is found in the perfused spleen in a greater amount, than in the normal spleen. In these survival experiments on the spleen, the nerves retain their excitability for a very considerable time after removal of the organ from the body.

## EYE, EAR, NOSE AND THROAT.

**Hay Fever Toxin and Antitoxin.**—The interest which has attended the experiments of Dunbar of Hamburg with the toxins and the antitoxins of hay fever, has prompted investigations by other observers. Semon of Berlin has already corroborated Dunbar's results from the clinical standpoint and a further report has lately been published by P. MCBRIDE (Edinb. Med. Jour., July, 1903). The experiments were conducted in six individuals, four of whom were subject to hay-fever.

Three of these gave very typical reactions, but one case was refractory. The latter had undoubted attacks of hay-fever, but also experienced similar attacks during the winter, of unknown origin. Although Dunbar has probably isolated both a toxin and antitoxin, the author believes that clinically there are numerous cases in which the theory that hay-fever is caused by the pollen of grasses only does not afford a satisfactory explanation. He has observed cases in which the attacks came on as the result of atmospheric conditions, such as the time of a hoar-frost and also mentions an instance where the attack came on the patient as he came in contact with horses independent of the season. The clinical use of the antitoxin is still sub judice.

**Otitis Media in Infancy.**—The frequency of this condition in infancy and its importance in differential dagnosis is insisted on by J. L. Morse (Jour. Am. Med. Asso., July 18, 1903). In all doubtful cases the ears should be thoroughly examined with a speculum. In many instances there is no sign of pain or many may have pain somewhere but show nothing by their actions by which the seat of the pain may be determined. Tenderness on pressure over the mastoid is also a very unreliable sign, as it is unusual in simple acute inflammation of the middle ear and most sick babies will cry if pressure is made on any part of their body. Acute otitis media is usually associated with fever, and reflex symptoms such as convulsions are not uncommon and may lead to a diagnosis of meningitis, pneumonia, gastritis, worms, dentition, etc. It is most commonly mistaken for pneumonia. A case so diagnosed and also another in which the symptoms seemed to point to cerebral trouble, are reported by the author. Acute secondary inflammations of the ear are more common than the primary ones, and occur as complications especially of diseases of the upper part of the respiratory tract. They are also common in diseases of malnutrition. Although the trouble may cause some symptoms, it may also go on perforation of the drum membrane without producing any symptoms whatever. The matter suggests the routine examination of the ears no matter what the disease.

**Treatment of Laryngeal Tuberculosis.** — Every methods of treating this condition in order to be attended by favorable results must reach the deeply infiltrating lesions of the disease. In accomplishing this it is also desirable that it should be done without causing any extensive injury to the overlying mucous membrane, on account of the possibilities of a secondary infection. L. Grunwald (Münch. med. Woch., June 23, 1903) recommends for this purpose the employment of the galvano-puncture, which he applies in the following manner: after proper anesthetization of the larynx, a very fine platinum cautery point is applied to the area of infiltration, and when it becomes incandescent, it is gently pushed down into the tissue. When the infiltrated area rests on healthy tissue, the latter affords a feeling of resistance to the further progress of the cautery point, and the latter must not be pushed any further. If the infiltration lies free and unsupported, the penetration of the needle is indicated by a red glow in the trachea. As soon as the point can be freely moved about in the tissue, it may be withdrawn. The procedure usually lasts from 5-10 seconds. The reaction is remarkably slight. In a few cases a small degree of swelling was observed in the surrounding parts, but pain was rarely present. In a few severe cases, some dysphagia was noticed, and in others in which a previous dysphagia had been present, it immediately disappeared. The author also remarks that this procedure is not necessarily limited to tubercular infiltrates, he also employed it successfully in an advanced inflammatory hyperplasia.

## THERAPEUTICS.

**Local Treatment of Diphtheria with Antidiphtherin.**—The belief held by a certain number of clinicians that Loeffler's bacillus does not gain access to the blood or internal organs but remains localized at the site of the diphtheritic lesion, is shared by M. Aramian (Jour. de Méd. de Paris, June 28, 1903). He therefore deems it more logical to attack the organism through local application rather than seek to neutralize its toxins through injection of serum. Excellent results are reported by the author from the use of a preparation to which he gives the name of antidiphtherin, the composition of which he intends shortly to present to the French Academy of Medicine. The remedy is applied with a swab three to six times daily; the tonsils, larynx, nasal fossæ, etc., being readily reached by this means. Of fifty-three cases so treated in his private practice, there were but two deaths; and these he attributes to complications which had developed prior to the application. For his method of treatment he claims absence of the dangers sometimes attending serum-treatment, facility of application, the possibility of preserving the preparation almost indefinitely, a recovery as rapid and probably more certain than with serum-treatment and early disappearance of the bacilli from the affected part; thus rendering prolonged isolation of the patient unnecessary, and greatly reducing the liability of contagion.

**Sciatica Cured by Local Injection of Antipyrin.**—Success is reported in the treatment of what the author calls primary sciatica—that is sciatica induced by causes acting directly upon the nerve, such as strain of the leg through excessive fatigue, cold, etc.—with hypodermatic injections of antipyrin in the course of the nerve, by P. Adolpho (Gazz. Osped., June 28, 1903). By means of a Pravaz's syringe provided with a long needle, 15 minims (one c.c.) of a solution containing 1¼ drams (5 grams) of antipyrin and 2½ drams (10 grams) of water, was injected at a point midway and slightly above a line reaching from the tuberosity of the ischium to the great trochanter; the needle being thrust in deeply till the nerve was reached. These injections, given daily, were entirely painless; and at the end of a week, pain ceased entirely in one case, and after ten days a like relief was experienced in the second. Two months having passed without a recurrence of the trouble, the author feels justified in considering the cure a permanent one; and concludes that in rebellious cases of sciatica which, as in the two cases reported, resist other methods of treatment, injections of antipyrin should be tried.

**The Action of Adrenalin.**—As a result of a series of investigations and experiments on the action of adrenalin, Simonovich (Roussky Vratch., No. 24, 1903), arrives at the following conclusions: (1) The drug, in the doses employed, exerts a general effect only when injected into the blood; (2) introduced per os in quantities far exceeding the maximum therapeutic doses (0.01) it fails to produce any subjective feeling; (3) the failure to exert a systemic action is due not so much to the action of the liver as to the slow absorption of the adrenalin, for injections into the intestinal veins produce an effect from comparatively small doses; (4) injuries of the gastro-intestinal mucous membrane do not increase the absorption of adrenalin; (5) the application to mucous membranes, *e.g.*, to stop gastric hemorrhages, is not attended with any systemic toxic effect; (6) the maximum dose may be considerably increased if the drug be administered for its general effect, but in the local application the frequency of the application is more important than its dose; (7) glycosuria from adrenalin is evidently due to toxicity.

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## SUICIDE AND SYPHILIS.

Almost every physician in general practice has felt at some time the strain of terror over the possible effect of his words to some unfortunate youth. To cite an imaginary case which is by no means imaginary. A well-favored young man consults him to know whether he is in a position to announce his engagement, or to set the date of his marriage. The physician bound by a moral code tells him that he is syphilitic and cannot safely marry for several years. The youth shows shock, or horror, or despondency, and mutters that he might as well make an end of the whole thing at once. The physician cheers and encourages him, and thinks he has fortified his hopes. The youth departs pledging his one confidant to secrecy. A few days pass, his parents come. The son has disappeared. A last note mentions a necessary journey, but letters fail to bring a response. Can the physician give any clue? The parents are naturally in an agony of uncertainty, but does not the physician guarding the boy's secret, and dreading to read the morning papers suffer more than justice should permit? If, as is often the case, the journey is but the spasmodic effort of the young man to hide himself and his shame, time relieves the physician's anxiety as well as effects his patient's cure. But if it happens, as it does too frequently to be ignored, that the boy ends his life with a revolver, or a gas-tube, the physician will always feel that he is responsible, although without blame, for the suicide.

Conan Doyle, in his collection of medical tales "Around the Red Lamp," discusses the situation. There the victim of hereditary syphilis tells the specialist who makes the diagnosis that he is on the eve of wedding a well-known society girl. The next morning the physician reads in the list of casualties that his patient was *accidentally* killed while crossing the crowded avenue the evening before.

The question of the physician's responsibility is a moral and not a legal one, and yet it is worthy of serious consideration. M. Alfred Fournier, in a recent communication to the *Bulletin de l'Academie de Médecine* (July, 1903) quotes a number of suicides which were traced either directly to the physician's diagnosis or to the patient's fears that such was the real nature of his disease. In presenting the subject from his own experience as well as collecting instances from his confreres he broadens the subject to a general discussion of Suicide in Syphilis. He mentions cases where, as a result of syphilis, the patient has developed mental trouble, and commits suicide because he has become insane or intensely nervous, and classes with these the patients with a neurotic tendency, as the result of inherited syphilis, who are naturally predisposed to suicide.

In a second class he cites instances of persons who have committed suicide because of the loathsome conditions of their disease, or because they feared such consequences. In a third class he cites the cases of those who, from honor, or shame, or shock that upsets the reason, or fear, commit suicide immediately on learning the physician's diagnosis, and in the fourth class he places those patients who, because of the social aspect of their disease, being about to be married, or to return to their homes, thought it the only honorable solution thus to end their lives.

Unquestionably many of the inexplicable cases of suicide are due to the greed of those sharks that advertise in the lay and religious press, who under the guise of regular physicians, diagnose and offer to cure (confidentially) diseases which the young as well as the married are ashamed to take to their regular family physician. To heighten the necessity for such treatment, these "Old Doctor Blanks" paint the most lurid horrors if treatment is not immediately begun.

Casting out, however, the methods of the un-

professional the question is, "How shall the physician best guard society from infection, and at the same time consider the individual's point of view."

Undoubtedly it is his duty to impress the many avenues of contagion upon his patient, as well as to forbid him to enter into any marriage relation, but at the same time it is his duty to arrive at the point slowly and to point out every encouraging feature.

M. Alfred Fournier, from his own experience, as well as from the experience of others, has come to the conclusion that it is unwise for the practitioner ever to make his diagnosis abruptly. No matter how sure he might be that a chancre was syphilitic, he should at first lead the patient to believe that an exact diagnosis could not be made at present, and not until after accustoming him by degrees to the possibility of the disease and to its most hopeful outcome should he by the third interview admit that the disease was syphilitic.

It is the first shock as a rule that counts with patients, and the susceptibility of the individual to his own moral sense is something that the physician cannot count upon, even though the patient be his friend.

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## RADIUM IN THERAPEUTICS.

In our account of recent advances in the scientific knowledge of radio-active elements we suggested the possibility of the importance of these metals in therapeutics and especially in the treatment of malignant diseases, as soon as the expense of the present difficult methods of preparation had decreased to such an extent as to make a sufficient quantity of the metals available. It seems that our prophecy in the matter has proved true even before any great reduction in their price. The energy produced by the radio-activity of radium particularly is of so intense a character that even with the minute quantities of it which physicians are able to obtain some very interesting results have been secured. The cable reports of the past week show that in Vienna the metal radium has been used with excellent effect on a number of patients suffering from the most intractable forms of malignant disease. We sincerely hope that these preliminary reports will be confirmed by further details.

Patients have been presented before both the prominent medical societies of Vienna, the Society of Physicians and the Imperial Academy of Sciences in whom cancer has been cured, at least for the time being, by exposure to the rays of radium.

As we suggested in our previous editorial the effect of radium upon the external layer of cells is such that after an exposure of a few hours a slough ensues and the resulting ulcer is so difficult to heal that it is very evident that the trophic nerves to the part have been interfered with. As a malignant neoplasm is after all an exhibition of hypertrophy of tissue under the influence of some irritant, be it a parasite or something else, or is due to a disturbance of the normal vital relations of cells to one another with the consequent production of a cell insurrection, as it were, it is evident that the disturbance of the trophism of the part may well prove the secret of the natural cancer cure. This is probably the way in which the mixed toxins act, when they produce their wonderful curative effect.

The first patient presented to the medical societies of Vienna was a man of sixty-one, who had suffered for many years from cancer of the lips, which in spite of numerous operations had not been eradicated, but had eventually invaded the palate. This invasion had become so extensive that during the early months of the scholastic year 1902 the surgeons had pronounced further surgical treatment as likely to prove fruitless. Under these circumstances the use of radium was suggested and a very minute portion of the bromide salt of radium was obtained. This is the purest form of the material as yet available, and it is said that only a very minute portion, a few milligrams, scarcely more than a tenth of a grain, were employed. The malignant condition gradually healed and for some time has ceased to give any manifestation of activity.

At the last meeting of the Imperial Academy of Sciences of Vienna to which this patient was presented, further reports of the use of radium in the treatment of malignant disease were made. In one case a cure seems to have been effected in that most obstinate of all forms of malignant neoplasm a melanosarcoma. Of course it can be readily understood that such reports are only preliminary. Until at least three years have passed there must remain a question in the mind of serious physicians of any radical cure of cancer. The relief afforded by radium, however, seems to be exactly of the kind which is produced by the X-Rays, only the radio-active metal has the advantage of producing more intense and rapid effects and seems also to be more generally applicable than the X-Rays have proved to be. It is easy to

understand that the first reports are apt to be tinged by hyperenthusiasm, but a definite announcement that a new therapeutic agent is at hand is surely justified by what we know up to the present time.

From another important scientific body, the department of General Pathology in the Imperial Russian Institute of Experimental Medicine at St. Petersburg, there comes a further encouraging report with regard to radium in therapeutics. Dr. London, whose contributions to the discussion at the recent International Chemical Congress in Berlin attracted no little attention, has been defining the limits of the effect of radium upon the optic nerve by a series of very interesting observations. Ordinarily the crystalline lens, which by its concentrating action on light aids vision by means of light rays, rather prevents the action of radium rays upon the retina. This is not surprising, since many perfectly transparent substances act in just this same way, with regard to the X-Rays. On the other hand, where the lens is obscured or even where the optic nerve is degenerated, light impressions are produced by means of radium. In one case under Dr. London's observation an eleven-year-old boy, who had been blind from the end of his first year, as the result of atrophy of the optic nerve, has learned to recognize letters traced on screens with radium and to put together the letters thus formed into words.

It seems clear then that we are on the threshold of a new and perhaps far-reaching advance in therapeutics. It will not be long before other reports will bring confirmation of at least some of these results.

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### THE CASE OF BUBONIC PLAGUE IN BERLIN.

As the details of Dr. Milan Sachs' death while at work on the bacteriology of the bubonic plague reach us, some interesting facts are brought prominently to our attention.

Our readers undoubtedly remember the death, in 1898, of Dr. Müller at Vienna, who fell a victim to "laboratory" plague, after having spent considerable time in India where he studied the disease through daily contact with pest-stricken patients. So profound was the impression produced by this tragic death that the Austrian authorities forbade henceforth any experimentation on the plague bacillus within the domains of the kingdom. Dr. Sachs was commissioned, by the same Austrian Government, to conduct his investigations at the Koch Institute in Berlin.

It appears now that this ambitious and highly gifted young scientist, while filling his Pravaz syringe with pus from an infected guinea pig for the purpose of transferring it to the culture medium for colonization, had the misfortune of admitting into it a few air bubbles, and in forcing the pus out a drop of it sputtered over him, and thus became the starting point of infection.

The disease manifested itself on the fifth day, examination eliciting an ordinary pharyngeal congestion, a few swollen glands, slight apical dulness of the lungs and a few moist râles. However the marked feature of the case was the striking disproportion between the slight local symptoms and the grave general condition of the patient, as manifested by a high temperature, extreme prostration, etc. Unfortunately for the patient, through faulty arrangement, he was not conveyed at once to an isolation hospital, and when finally transferred there was in an unconscious condition. Meanwhile the diagnosis, both clinical and bacteriological, dissipated whatever doubt had been entertained as to the character of the affection (the pneumonic form of the disease is not at all typical of plague, and may be mistaken for bronchitis, broncho-pneumonia or croupous pneumonia), but by this time the unfortunate sufferer was beyond human help. The autopsy showed those of typicalwhen the manod also those of pulmonary tuberculosis. Of those who came in contact with the deceased, a hospital orderly suffered a mild attack of the disease evidently modified by the injection of the prophylactic anti-bubonic serum. The physicians and other attendants on the case received similar injections, while strict measures for isolation and immunization were adopted toward all who came in any relation with the case.

The question of following Austria's example by prohibiting any laboratory experiments and study on the plague bacillus in Germany was agitated in the lay as well as in the medical circles, but the prevailing opinion was in favor of continuing this most valuable laboratory work. The biology of the plague bacillus is as yet but little known, and the problems of immunity, and the production of a sufficiently strong anti-plague serum require a great deal of earnest study. The rarity of the disease precludes any possibility on the part of the average physician to diagnose its early stages, and laboratories where trained diagnosticians may pursue their studies are of great importance, especially for seaports, which are most of all liable to the dangers of infectious diseases.

As regards Dr. Sachs' case, it must be recognized that his general vitality was lowered by tuberculosis, and his resisting powers to infection accordingly reduced. A suggestion was made that in the future an applicant's physical fitness for laboratory work should be looked into with as much care as his scientific attainments, and while in the laboratory an examination of his physical state be made daily.

What is most instructive in the case for us, in view of the recent occurrences at San Francisco, is the remarkable attitude of the public in Berlin toward the whole affair, namely the entire absence of any panicky feeling to the population. This was principally due to two factors: the wide publicity, absolutely without any taint of sensationalism, given to it by the press, and the implicit confidence in the sanitary measures undertaken and carried out in a fearless and decisive manner by the authorities. The detailed daily reports on the doings of the sanitary board have more than anything else served to allay whatever apprehension might have been felt by the people. The results thus far show this to be the safest as well as the most rational method to be pursued by health boards in similar emergencies, and the conduct of the Berlin authorities will serve, let us hope, as an example to be followed by others.

## ECHOES AND NEWS.

### NEW YORK.

**Honor to Dr. G. R. Butler.**—Dr. Glentworth R. Butler, of Brooklyn, has been elected a life fellow of the Society of Science, Letters and Art of London.

**New Dean at Long Island College Hospital.**—Dr. J. D. Rushmore has been elected Dean of the Faculty of the Long Island College Hospital, in place of Dr. J. H. Raymond, resigned. Dr. Raymond was elected to succeed the late Dr. J. S. Wight.

**New Dispensary for Mt. Sinai Hospital.**—The Association of the Mt. Sinai Hospital has just purchased property in Pine street on which to locate a new dispensary.

**A New Possibility for Blackmail.**—A bill was signed by Governor Odell some time ago making it a misdemeanor to distribute patent medicines so that children may get at them. It should be borne in mind by physicians that after this they may be blackmailed by some enterprising crooks if they neglect to empty out all patent medicines preparatory to throwing them in the waste basket. Ostensibly the bill is to have for its purpose the protection of the children of ragpickers, etc., who, tumbling over summer ashbarrels, find boxes and bottles of death-dealing drugs within them. Tempted by the seductive colors and tastes, they go to their doom unmindful of the dangers lurking in the patent medicines. Still another avenue to blackmail the physician seems to have been opened and we counsel caution.

**Dr. Lederle in Favor of Abolishing River Baths.**—President Lederle of the Department of Health does not regard with favor the free municipal baths along the river fronts. He regards them as the primary cause of a certain amount of infectious disease among those who frequent them, and as dangerous to the general health of the city. Since the hot months began he has had a number of the bath-houses moved from their anchorages because of polluted water or other good reasons. In some cases it has been found necessary to put two houses at the same anchorage for lack of suitable locations. The question of getting rid of the river front baths and substituting plunges and shower baths of pure clean water is now being considered by the Health Department. Commenting on the subject to-day, Dr. Lederle said: "The floating baths along the river front, which are necessarily located in more or less sewer-polluted water, are probably the primary cause of a certain amount of infectious disease among those who frequent them. Thousands of persons patronize them during the summer months, but they do this rather for recreation than for cleansing purposes. During their baths they run the risk of taking in through the skin or inhaling or swallowing germs of infection of various diseases, such as typhoid fever, diarrheal diseases, consumption, and through contact chiefly, acute conjunctivitis (pink eye), and certain skin diseases. The average citizen has no idea of the enormous quantity of sewage which is dumped every day into the rivers which border this city. The sewers discharge at the bulkheads and under piers at the ends of streets, and the sewage is frequently retained for long periods by eddying tides, after which it may be carried to sea by the ebb, or may have time to settle into the slime of the river bed. With a constant flow of sewage, the marginal water is never uncontaminated, and therefore it is impossible to keep the water in floating baths other than unsanitary, if not positively dangerous. It is accepted as certain that more or less disease is yearly transmitted as a result of the condition of these baths, and their use has only been permitted and not advised by the Health Department during the summer season. In consenting reluctantly to the continuance of baths along the river front, the Health Department had in view the needs of the poor people for cooling and recreation during the heated summer, and there was, of course, the prospect that before another year sufficient provision would have been made by the city for free public baths in the crowded sections, where hot and cold fresh water would be provided, and the needs of the inhabitants for bathing met in that way. It is a matter of great satisfaction to learn that the city is proceeding with the construction of such baths, appropriations for which the Health Department has frequently urged upon the Board of Estimate and Apportionment. When enough of these baths have been provided, much will have been done in the way of prevention, through personal cleanliness, of the infectious diseases so frequently occurring among those whose homes lack proper bathing facilities. I venture to say that there is no greater public need in this city to-day than an adequate number of free baths."

**Unity of the Medical Profession.**—Dr. A. T. Bristow, President of the State Medical Society, said the following, among other things, at a recent address given before the Associated Physicians of Long Island:

"One of the most important things for the medical profession to-day is unity. Unfortunately, as you know, dissensions have existed in our ranks in this State for many years. Originating in a ques-

tion of principle, the strife has been correspondingly bitter. We wage war in behalf of a neighboring island, and victor and vanquished soon forget the brief animosities engendered, but it has taken decades to efface the recollections of the wars of religion. A battle for principle has many resemblances to the religious war. Such has been the battle of the code and each side has striven for the right according to the different points of view of the contestants. When I was elected President of the State Society last winter, the prospects of unity seemed remote. The question of the code was involved in much obscurity, and no one seemed to know just what its position was. Moreover, the State Association insisted as a *sine qua non* to union that the State Society should apply for a new charter together with the Association. This seemed to me the most insuperable barrier to union, for the State Society prized its old charter, now nearly one hundred years old, and refused to do anything that would cause it to lapse. This was a question of sentiment, to be sure, but let me remind you that many of the things that we hold most dear are matters of sentiment, that is to say, affairs of the heart rather than of the intellect. Patriotism is a sentiment, so is the affection of parents and children, and so is religion in so far as it concerns the heart rather than the head. Our most precious possessions are thus matters of sentiment, so it was not strange that the State Society should be unwilling to allow its ancient charter to lapse. We are but a young country. We have few associations with a remote past, and those that we have we should cherish. I do not believe that the Association appreciated this feeling, nor, perhaps, foresaw it. On the other hand, it seems to me a perfectly natural and proper feeling on the part of the Association that the members should wish for some legal recognition of the reunion. Otherwise, it would be necessary for them to abandon their organization and join the State Society as individuals, something, in my opinion, that the State Society will by no means expect. Inasmuch as both parties to the dispute of thirty years ago contended for principle as each saw it, neither side should now be penalized for the contention which is a thing of the past and feelings of mutual concession and toleration should prevail. All ought to try to assist those who are working for unity and not be on the lookout for unreasonable objections, with intent to hinder. It has seemed to me that it might be possible to draw up an act which should preserve the old charter of the State Society and add to this the desirable features of the Association charter and thus comply with the wishes of that body that some legal recognition should be taken of the new order of things. In this way neither organization would perish, but the two bodies would simply merge. Unification would, in this manner, be accomplished without loss of dignity on either side and the reorganization would take place as it ought, in a manner honorable to both the subscribing parties, and with undue advantage to neither. If the matter of the charter can be arranged on these lines, as I am sure it can, then there is nothing whatever to keep us apart. The code question has been forever settled by the liberal and progressive spirit shown by the American Medical Association and the profession of this State will be much to blame if it allow ancient prejudice or revived animosities to stand in the way of unity. It will not be long before this whole question will come up before the rank and file of both societies, and it will then become the duty of every man to see to it that nothing but matters of principle shall allow this breach in our ranks to continue. No such question exists. Every one recognizes that. All men say that we ought to unite. Let me then urge on every one here that it is an individual duty which will soon confront us. If you wish unity you can have it for it will be a question of the ballot. If you do not get it, do not blame the conference committee, nor the officers of the two societies. Blame yourselves, for there the responsibility must finally fall."

**Duty of Health Boards to Smallpox Patients.**—It is the undoubted duty of a town Board of Health, says the Fourth Appellate Division, by Presiding Justice Adams, in the case of Garra K. Lester against Joseph H. Eno and others, to take immediate and efficient steps, when smallpox develops within its jurisdiction, not only to furnish care and attendance to persons afflicted with the disease, but to protect, as far as possible, the residents of the town from the danger to which they are exposed by reason of its contagious and malignant character. To this end the Board of Health is authorized to incur any reasonable expense, and the expense thus incurred becomes a charge upon the town. The court therefore held that where the Health Officer of a town, acting under the authority of the town Board of Health, orally employs a physician to treat and care for all patients in the town who were then, or might thereafter be, afflicted with smallpox, assuring the physician that he would be well paid for his services, the town is liable to the doctor for the reasonable value of the services rendered by him.

## PHILADELPHIA.

**Increase in Typhoid and Smallpox.**—The cases of typhoid fever for the week ending August 1st numbered 109 as compared with 65 for the previous week. During the same period the new cases of smallpox were 29 as compared with 11 for the previous week. The mortality from the latter disease was only three, as against 11 the preceding week. One case of black smallpox in Port Richmond caused the vaccine corps to work in that neighborhood all day on Sunday. The death rate of infants shows a gratifying decrease, the deaths being the least of any week since the summer began.

**Phipps Institute Asks for Charter.**—The Phipps Institute for the Cure and Prevention of Tuberculosis has applied to Common Pleas Court for a charter. The work of the institute has grown to such proportions that the managers decided that a charter was necessary to enable the work properly to be carried out.

**Typhoid in Pittsburg.**—The epidemic of typhoid fever in Pittsburg still continues. During the six days ending August 1st there were reported 102 new cases of the disease, almost as many as during the preceding week. The city water supply is supposed to be the source of the disease.

**Result of State Board Examination.**—Of the 392 applicants for authority to practice medicine in the State of Pennsylvania, who were recently examined in this city and Pittsburg by the State Board of Medical Examiners, 339 were successful. Fifty failed to obtain the necessary 75 per cent. average; one was expelled for cheating and two withdrew because of illness.

**Pennsylvania Hospital.**—A committee of former resident physicians of the Pennsylvania hospital, consisting of Drs. James C. Wilson, Frank Woodbury and T. H. Andrews, has authorized the painting of a portrait of the late Dr. Thomas G. Morton. It will be a three-quarter length picture and is to be completed in November. At that time the picture

will be publicly presented to the hospital and hung among other portraits of those who have been honored in the medical profession.

**New Hospital to be Erected.**—It is stated that a new hospital, to be known as the Union Mission Hospital, is to be built by the John B. Stetson Company in Fourth street, below Montgomery avenue. The building is to be a fire-proof brick structure, three stories high and 65 by 102 feet in size. A roof garden will surmount the building.

**Deaths from Adulterated Milk.**—Two deaths at Johnstown, Pennsylvania, apparently traceable to the use of injurious drugs to preserve milk, have prompted State Dairy and Food Commissioner Warren to inaugurate a general movement against those who sell adulterated milk. Of 1,000 samples obtained in the Eastern and Western parts of the State, 75 per cent. contained formaldehyde or other similar fluid. A State laboratory for the examination of foodstuffs is soon to be installed in Harrisburg.

## CHICAGO.

**Licenses for Infant Nurseries.**—So far the city clerk has issued two licenses and permits to conduct infant nurseries in the city.

**Endowment of Free Beds in Hospitals.**—By the will of the late Horace P. Taylor, St. Luke's and the Chicago Baptist Hospitals each receive $9,400 for the endowment of free beds.

**Injunction Secured by Dr. Orsinger.**—Dr. Frederick L. Orsinger has secured an injunction restraining the State Board of Health, Justice Chott, and his constable from causing his imprisonment or enforcing a judgment of $100 and costs secured against him for violation of the medical laws.

**Diphtheria.**—Diphtheria is still prevalent, and the weekly number of deaths remains higher than usual for the season, but not to an extent warranting certain sensational statements recently published.

**Low Death Rate Among Aged.**—A phenomenally small proportion of deaths among the aged was one of the noteworthy features of a remarkably low July death rate for the week ending July 25th. There were only 55 deaths among those over sixty years of age reported out of the total, 513 at all ages, while the rate for the total—14.19 per thousand—is the lowest ever recorded for any July week in Chicago.

## GENERAL.

**In Honor of the Late Major Walter Reed, M.D.**—A meeting will be held at the Hotel Louisburg in Bar Harbor, Maine, on the morning of Saturday, August 15, 1903, at eleven o'clock, to confer with respect to a memorial in honor of the late Major Walter Reed, M.D., U. S. A., to whom the world is indebted for most important services in the investigation and the suppression of yellow fever. All of our readers are respectfully invited to be present. Several committees in different parts of the country have already been appointed, and the object of this conference is to secure unanimity of purpose, and concerted action. Addresses may be expected from gentlemen who are well acquainted with all the facts. In behalf of many friends of Dr. Reed,

Daniel C. Gilman,
Chairman of a Committee Appointed by the American Association for the Advancement of Science.
S. Weir Mitchell,
Edward G. Janeway,
William H. Welch,
Christian A. Herter.

**Mortality in European Armies.**—Official figures show that during the years 1888 to 1900 the mortality in the French army was more than double that in the German army.

**Tuberculosis in Europe.**—An official health report from Berlin states that in a million inhabitants, Russia has 4,000 tuberculous subjects; France and Germany 3,000 and England, Belgium and Italy 1,000.

**Pathogenesis of Tuberculosis in the Sixteenth Century.**—An Italian work, in which the author gives expression to his ideas as to the true method of propagation of tuberculosis, has recently come to light. This book is said to have been published in Venice in the year 1520, and was announced as "A new work entitled 'Why,' a useful volume for ascertaining the reason of many things." In this work the author makes the following statement: "From the sputum of the phthisical patient or from his mouth a fetid vapor arises, which, entering the mouth of the person with whom he is conversing, penetrates to the lungs and produces phthisis."

**Rhode Island Medical Society.**—The ninety-second annual meeting of the Rhode Island Medical Society was held in Masonic Building, Providence, June 4, 1903. The President, Dr. George F. Keene, presided, and about 150 Fellows and guests were present. Dr. Halsey DeWolf, Secretary, reported for the Trustees of the Caleb Fiske Fund: that the amount now at their disposal is $1,147.18. The prize of $250 for the best essay upon the subject, Auto-intoxication as a Cause and Complication of Disease, was awarded to Dr. W. Louis Chapman, of Providence, R. I. The subject chosen for the prize essay of the coming year, 1903-4, is the Action of Light as a Therapeutic Agent, and the amount of the prize offered is $250. It was voted to hold the next meeting in Newport, R. I. The following physicians were unanimously elected to Fellowship: Dr. Samuel Marsden Beale, Jr., Howard; Dr. Edward Campbell, Providence; Dr. William Francis Flanagan, Providence; Dr. Herman Canfield Pitts, Providence, and Dr. Henry Bertram Potter, Providence.

**Typhoid in Germany.**—It has been decided in Germany to wipe typhoid off the map and with this end in view most vigorous procedures are being planned by the Koch Central Bureau. Typhoid stations are being established throughout the German Empire with fully equipped laboratories and a well-paid staff of assistants. Every case of typhoid is to be tracked to its source and to be carefully isolated. The police force is at the service of the commission. Altogether the movement is both formidable and magnificent.

**Mosquito Destroyer to be Tested.**—Dr. Stiles will leave Washington, says the press agent, for Cape May or some other point in New Jersey where the mosquito rules, to pursue his researches into the efficacy of the parasite which it is said will exterminate mosquitoes by the million. The investigation to be made by Dr. Stiles is undertaken at the request of Prof. Smith, of Rutgers College, State Entomologist of New Jersey, who has aided Dr. Stiles in his search for the destroyer.

**Pure Food Law.**—The first tests under the recent law to prevent the importation of adulterated food are provided for in an order issued July 30, 1903, by the Treasury Department, authorizing the chemists of the Department of Agriculture to take for analysis samples of certain cargoes now on the way to American ports. The officers of both departments decline to state what these cargoes are or to name the vessels in which they are being transported, giving as a reason that if it were found on analysis that

the merchandise did not fall within the prohibition of the statute, harm would be done its owner by the attending publicity. Chief Chemist Wiley of the Department of Agriculture, under whose direction the tests will be made, said to-day that so far attention had been directed only against such products as spices, peppers, canned goods, cheese and other articles of the kind which had been under suspicion in the past. Declarations made before the American Consuls abroad concerning certain shipments included in the list named have already reached the Department of Agriculture, and as samples sent from the port of shipment could not reach the Department in time for the completion of the analysis before the entry of the cargo at the port of destination, the inspectors will meet the cargo on arrival and take the samples then. All the cargoes selected for analysis are now on the way. Declarations from abroad as to the purity of shipments are being received at the Department daily, some of them coming from the Orient. This work is being carried out by the United States Consuls, who notify the Department of all shipments of foodstuffs and transmit the declarations of the shippers.

**Electricity as a Therapeutic Measure.**—According to L. Guthrie (*Medical Magazine*, July, 1903) the first mention of electricity as a therapeutic measure is made by Salmon, an Englishman, in his book called "The Dispensatorie," which was published in 1676. He alludes to the use of the electric ray, torpedo or "cramp fish" in dropsy, consumption and headache. "The same helps the gout," says Salmon, "when trod on till the Stupidity reach the knee."

**Certified Milk as it is Made.**—The recent discussions on certified milk would seem to have borne excellent fruit, as witness the following from *Harper's Monthly*, anent the

"CRAFTY COW":

There was a Piper had a Cow.
And he had Naught to Give her.
So he pulled out his Pipes, and Played her a Tune—
Consider, Cow, consider.

The Cow considered Very Well.
"You've done the best You're able."
She said: "Now put my Halter on.
And lead me from the Stable.

"Take me to where the Health Board Sits,
That It may Certify
That You are You, and They are It,
And also I am I."

The Piper Did as he was Bid.
And When the Health Board Spied
A Decent Cow who had till Now
Gone on Uncertified—

It Waked and Wept
Where it had Slept,
And said, "We Certify
That you Are You,
And he Is he,
And also We are I."

From Then till Now
That Clever Cow,
Presuming on her Label,
Has made the Piper
Work the Pump,
And Lolled about the Stable.

**A Journal on Syphilis.**—We learn from the *Journal of Cutaneous Disease* that *La Syphilis* is the title of a new French monthly edited by Dr. T. Barthélemy to be devoted entirely to this special field of medicine. The first number contains an original article on syphilis of the stomach by Prof. Alfred Fournier; a clinical lecture on the same subject by Prof. Dieulafoy; a general program by the editor outlining the plan and scope of his new work; clinical lectures by Gaucher and Brocq; a department for brief notes on cases which in themselves might be considered of too little value to be published, but which in the aggregate would be of great value to special investigators; a department for correspondence in which replies are requested to a number of debated questions, such as "double infections," conceptional syphilis as regards the mother, pigmentary syphilides of the neck, etc.; a department of therapeutics and society proceedings, especially societies for venereal prophylaxis; and finally a special abstract and bibliographical department. We echo the best wishes of the editor of the *Journal of Cutaneous Disease* for the success of *La Syphilis*. May it accomplish much towards the prevention and cure of a disease which "although venereal in its manner of approach is not so in its manifestations." By boldly adopting as title a name so often shunned or stigmatized with moral obloquy, a long step is made towards placing syphilis beside leprosy and tuberculosis as one of the great plagues of mankind and with them fully entitled to a special organ.

**Insanity in England.**—The annual report of the Lunacy Commissioners shows an enormous increase in madness in England and in Wales. In 1859 the number of insane was 36,762, or one in 536 of the population. There has been a steady increase from that time up to January 1, 1903, when the number of insane was 113,964, or one in every 293 of population. The rate of increase since 1894 has been especially notable, the gain being from 92,067. There was never such an increase in the numbers of insane as in the year ended December 31, 1902, the increase over the previous year being 3,251. The number of persons who lost their minds in 1902 alone was 22,581, or almost 500 per week. The increase was found almost entirely among pauper lunatics. The proportion of lunatics privately cared for to the population is about the same now as it was in 1859, whereas the pauper proportion is twice as high. A carefully compiled table explains as far as possible the causes of lunacy. The list is headed by drink, to which 23 per cent. of male and 9.6 per cent. of female cases of insanity is ascribed. Heredity accounts for the greatest number of women lunatics, the proportion being the high one of 24.6 per cent. In the case of men, heredity accounts for 18.8 per cent. of insanity. Previous attacks come next with 23.1 per cent. of women and 16.2 per cent. of men. In cases of unknown causes, men come first with 17 per cent. and women follow with 15.4 per cent. The general impression that the increase of lunacy is due to the mental wear and tear of modern life is not supported by the figures. Adverse circumstances, including business anxieties and pecuniary difficulties, account for the lunacy of 6.2 per cent. of the men and 3.8 per cent. of the women; mental anxiety, worry and overwork, 5.7 per cent. of the men and 5.9 per cent. of women; love affairs, one in 200 of men and three in 200 of women. There is about the same proportion of insanity through fright and nervous shocks. According to the figures of the commissioners, physical, rather than direct mental causes are responsible for the great increase in insanity. One case in three can

be traced to some disease or disorder. The percentage of old people who have lost their minds is as seven men to eight women. The age limits between which the majority of patients are admitted to asylums are 25 to 44. One-fourth of all those admitted to the asylums are found to have suicidal tendencies. Lunacy is increasing more in the country than in the cities. In Hereford and Exeter there is a higher percentage than in London, yet the average increase of insanity in the capital has attained the enormous figure of 500. Dr. E. W. White, who was recently elected President of the Medical-Psychological Association, points out that not only is insanity increasing, but that in the last thirty years there has been no material advance in the rate of recovery, despite the numerous new and rational principles of treatment. London particularly suffers from unlimited numbers of the worst kinds of cases of aliens and needy town dwellers, whose poor bodies and poorer minds are often sapped by disease. For this and another great cause of the increase of insanity, namely, the marriages of those tainted with lunacy, Dr. White advocates State regulations. He is also in favor of such Government control for the mitigation of the chief cause of insanity, drink. England within the last fifty years has become a spirit drinking nation. There is no standard of purity for spirits, and it is probable that the badness and rawness of many cheap whiskeys is responsible for much insanity, which laws for enforcing purity and maturity of all alcoholic drinks would prevent. Another factor in the increase of lunacy pointed out by Dr. White is the strain of modern education, which accounts partly for the enormous increase in insanity in the last few years in patients of the middle and upper classes between the ages of 18 and 28. Another cause is the fact that late marriages in the upper classes and early marriages in the lower classes are far more common than they were fifty years ago. Either extreme in marriage is regarded by the doctor as bad for future generations.

**Two Physicians Drowned.**—Dr. Adolph Cudell and Dr. Ernest H. Leute, two prominent young Cleveland physicians, were drowned in Lake Erie, off the German-American Clubhouse, August 5th. The two young men had procured a boat and, rowing a short distance into the lake, entered the water. Suddenly one of them was seen to throw up his hands, while the other man was swimming toward him. Before aid from the shore could be given, however, both had disappeared. It is presumed that one of the men was seized with cramps and that both were drowned while the second man was trying to effect a rescue.

## CORRESPONDENCE.

### OUR LONDON LETTER.

(From Our Special Correspondent.)

London, July 18.

THE KING'S SANATORIUM AND HIS ADVISORY COMMITTEE —SIR JAMES CRICHTON-BROWNE AS THE AVENGER OF CARLYLE—A SNUB FOR THE ANTIVIVISECTIONISTS—A VICTIM OF SCIENTIFIC RESEARCH.

I announced in my last letter that Sir Frederick Treves had retired from practice. This decision on the part of a surgeon in the very prime of life and in the full tide of success has naturally caused a good deal of surprise in the profession, mingled with speculation as to what a man so active proposed to do with himself during the long expectancy of life still before him. It has been publicly stated that he wishes to get into Parliament, but this soft impeachment he disowns. Whether this is more than an official denial remains to be seen. In the meantime the King consults him about all sorts of things. His Majesty has recently insisted on making him a member of the Advisory Committee to which he entrusted the building and organization of the Sanatorium which the calculated liberality of an Anglicised German Jew enabled him to found. The Committee has, I am told, incurred the wrath of the King because it has been so long incubating its plans. There was a difficulty in finding a site with a sufficient water supply; and now that a suitable site has been found there has been delay in getting to work. The King, who seems to think that sanatoria can spring up in a single night like mushrooms, is chafing at what he considers to be the dilatoriness of the Committee. Like the Grand Monarque who once said to his courtiers in horrified tones *J'ai failli attendre*, Edward the Seventh hates the very idea of having to wait for anything. He has added Sir Frederick Treves to the Committee in the hope that he may galvanize it into a more strenuous life.

The fact is that the King has conceived the notion that he has somehow been made the tool of designing persons in this matter. He expresses in racy Anglo-Saxon the belief that the movement for the suppression of tuberculosis is the crazy dream of a few faddists, which is being exploited by certain astute individuals for their own purposes, and he is furious at the thought that he has allowed himself to be used as a decoy. He thinks that the million dollars given him by Sir Ernest Cassel might have found a more useful application if the sum had been added to the King Edward the Seventh Hospital Fund. It is pretty clear that some interested person has got the royal ear and has instilled into it a poison which has had the effect of turning him against a scheme that might be of the greatest benefit to some of the most unfortunate of his subjects. He does well to be angry with his Advisory Committee, though not for the reason which he alleges. It is understood that it has signed a contract with a German physician who is to be the head of the new Sanatorium. This, when it becomes generally known, is certain to cause much indignation in the profession of this country. It was a fatuous thing to do, especially considering that two out of the six members of the Advisory Committee belong to the great Teutonic race. It is probably true that the nomination is due to female influence, to which our Gracious Sovereign is peculiarly susceptible, but, as is the way of royalty, he will doubtless throw all the responsibility of an unpopular appointment on the Committee. *Delirant reges, plectuntur Achivi*—the King rages, the Committee palavers, and poor consumptives suffer.

Sir James Crichton-Browne, who recently started an unsavory controversy about the married life of Thomas Carlyle, is one of the chief administrators of the Lunacy law, and can therefore speak with some authority on the vagaries of mad people. His judgment that poor Mrs. Carlyle at one period of her life suffered from insanity may therefore be accepted with the respect due to his special experience. But his attempt to represent Carlyle as a tender and considerate husband shows a talent for special pleading which might be regarded as incongruous in a scientific man were it not that men of science so often display such an amazing faculty of distorting facts and perverting the plain sense of words. Sir James Crichton-Browne, with a luxuriance of vituperation that would be more natural in a theological than in a medical controversialist, denounces James Anthony Froude for having traduced his hero. Yet Crichton-Browne's contributions to this controversy supply abundant examples of the un-

scrupulous methods with which he reproaches Froude. The general feeling in the profession, as far as I can gather, is one of disgust that a man who poses on platforms and in the newspapers as one of its leaders should have disinterred a forgotten scandal, and like one of the old "resurrection men" sold his foul booty for the delectation of the "many-headed beasts," which licks its chops with a special relish over any filth that seems to besmirch a great name. From most of the literary journals he has received very severe handling. But the thick hide of Scotch self-conceit in which he is swathed prevents even the keenest darts of criticism from penetrating to the quick. And his wares have doubtless sold sufficiently well for him to say with the miser in Horace:

Populus me sibilat, at mihi plaudo
Ipse domi, simul ac nummos contemplor in arca.

The Antivivisection cranks received a well-deserved snub from the Home Secretary the other day. No one can perform vivisection in this enlightened country without taking out a license like a publican or a cab-driver. It is the Home Secretary who grants these licenses; hence that functionary is freely used by the antivivisectionists as a target to shoot at. On July 15th a deputation from the Parliamentary Association of the British Union for the Abolition of Vivisection waited upon the Home Secretary and demanded that he should straightway suppress vivisection, or at any rate, until the time should arrive when public opinion would insist on its abolition, that he should lessen the number of experiments and the pain caused to the animals used for purposes of research. The Home Secretary, Mr. Akers-Douglas, dealt firmly and not over gently with the faddists. On one of them saying that the sight of vivisections induced a callousness that in some cases developed into a feeling of positive pleasure, the Minister declared that such a statement was a gross and grotesque libel on a high-minded and self-sacrificing profession. He went on to say that he had only to administer the Act (permitting vivisection under certain restrictions) and had no power to stop the practice. He declared further that nothing would induce him to introduce a bill for the abolition of vivisection into the House of Commons, or to recommend the Government to do so. The deputation had doubtless hoped to browbeat the Home Secretary, but got a lesson from him by which it is to be hoped that some of them will profit. The true inwardness of the situation does not appear in the newspaper reports of the interview. For two or three years past there has been internecine war between some of the leaders of the antivivisection movement—if that can be called a movement which never makes any headway. Miss Frances Power Cobbe and her adherents are abolitionists; their cry is *Delendum est laboratorium!* Mr. Stephen Coleridge on the other hand takes the more politic line of asking for the limitation of vivisection; he would not strangle it outright but slowly asphyxiate it by legal pressure. The two parties naturally hate each other with the fiercest sectarian hatred. The Coleridge faction has been a good deal before the public lately; it may therefore be surmised without much breach of charity that the deputation of the abolitionists to the Home Secretary was mainly inspired by the wish to show their supporters that they are still alive. There can be no doubt that antivivisectionism is losing ground in this country owing to the discreditable methods of controversy employed by its advocates. John Bull is stupid, but he likes common sense and he likes fair play; the wild denunciations of research offend the former sentiment, while the vile lies and odious imputations, thrown at scientific workers like filth in the hope that some of it may stick, outrage the latter. The followers, alike of Miss Cobbe and of Mr. Stephen Coleridge, are mainly composed of soft-hearted women and soft-headed men who greedily swallow any calumny, however gross, that may seem to discredit science which they hate with all the virulence of ignorance and prejudice.

In the list of pensions recently granted by the Prime Minister I see the name of "Mrs. Zare Elizabeth Blacker in recognition of the services of her late husband, Dr. A. Barry Blacker, who lost his life through his devotion to medical research, £120." This is the widow of Dr. Blacker, of whose sad fate I had something to say in a previous letter. He cured the King of a small rodent ulcer by the application of the X-rays, but himself fell a victim to an extensive malignant growth involving the shoulder joint. While curing the King he might have said, like the gladiators in the Roman Circus, *Ave Cæsar Imperator, Morituri te salutat!* The disease which killed him began in a burn of the hand caused by X-rays; this is probably the meaning of the allusion to his death having been caused by his devotion to medical research. The amount of money at the disposal of the Prime Minister for Civil List pensions is very limited; but I think some way might have been found of rewarding Dr. Blacker's important services more liberally than by a pension of $600 to his widow.

## THE HOMBURG SPA.

*To the Editor of the* Medical News:

Dear Sir: This representative German spa lies about 17 miles southeast of Frankfort-on-Main, from which city it is reached by frequent trains in from 25 to 32 minutes. The location is in the foot-hills of the Taunus range of mountains, about 600 feet above the sea-level. The town contains about 9,000 inhabitants and has been well known as a watering place since 1834. There are indubitable indications, however, that the early Romans who occupied the Taunus district from the beginning of the Christian Era until 300 A.D., used the water for medicinal purposes, as the foundations of their baths and sanatoria are still found in excavations for buildings, etc. There are documentary proofs of this use in the year 773. The situation here presents many natural advantages which the art of man has greatly extended and diversified. The town is situated on rising ground sloping from N.W. to S.E., and giving the main streets, three in number, the same direction. These are crossed at almost right angles by five or six side streets, running N.E. and S.W., with a gentle fall from the center street of about one per cent. The soil consists of slate, with a substratum of impermeable clay. To the excellent natural drainage gained by the conformation of the surface cemented pipes have been laid through most of the streets during the last ten years, and at this time the town is building a second system of pipes, so that the house and drain waters are entirely separated and all impurities carried out of the municipal precincts at once. The condition of the streets is positively unexceptionable from a sanitary point of view. It makes a New Yorker thoughtful to observe the jealous care with which minute scraps of paper, fallen leaves, etc., are gathered up and removed. The main streets are exceedingly attractive, being well-lined with shade trees and bordered by attractive and well-built hotels and private residences. Many of the latter indicating by modest signs that rooms are "Zu Vermiethen." Even Paris itself might be proud of the Kaiser-Frederick Promenade, the principal driveway facing the Kur-Park, and containing the villas of the wealthy summer residents.

The season here, as at almost all the German spas, lasts from May 1st to October 1st. As at Saratoga, however, August is the most important month, and the season is at this time just getting into full swing. A majority of the foreign visitors are English, but many Americans are seen, and the writer was delighted with a big photograph of the ever-popular junior Senator from the Empire State in a shop window this afternoon. The occasional torrid days at our home resorts are not known here. Light wraps are desirable toward evening all the summer. The temperature during the last few days has ranged from 55° to 68° F. The American visitor is struck by the entirely different management of the German spas from our own. Instead of being conducted by private individuals the springs are under the control of the town authorities. Our thrifty Teutonic friends have long since become acquainted with the value of their mineral springs as a source of revenue to the government. Every person remaining longer than three days in Homburg during the "season of cure," *i.e.*, from May 1st to October 31st, is looked upon as being here for the benefit to be derived from the waters, and therefore obliged to take a "Kur ticket" on the third day after arrival. The payment of the tax entitles the visitor to the use of the mineral waters for drinking, to the privilege of buying bath tickets, and gives admission to the Kur-gardens, promenades, concerts, etc. The tax for the season amounts to 20 marks ($4.80) for one person and somewhat lower rates for additional members of the same family. On the exempt list, I am happy to say, are physicians and surgeons and their families.

There is nothing hap-hazard about the treatment here. The first thing the health-seeker does after getting himself settled is to place himself absolutely in the hands of one of the medical men of the town, of whom there are some 18 or 20. I am constrained to believe that all matters pertaining to the "Kur" are conducted on a strictly honest basis. The local physicians are exceedingly jealous of the fair name of Homburg. If the patient can be benefited by a stay here he is given advice and treatment accordingly. If his case is unsuitable for the waters and climate, he is warned to get out without undue delay. It is regarded as highly desirable by the faculty to present an attractive morbidity and mortality table for comparison with numerous watchful and jealous competing spas not far away. The springs at Homburg are seven in number, known as the *Elizabeth-Brunnen, Kaise-Brunnen, Ludwigs-Brunnen, Louisen-Brunnen, Stahl-Brunnen, Landgrafen-Brunnen*, and *Sool-spruden Brunnen*, or Brine-well. The Stahl-Brunnen and Louisen-Brunnen are chalybeates. The others may be classified as muriated alkaline salines; all contain free carbonic acid, while several show sulphureted hydrogen in appreciable quantities. Following is an analysis of the Elizabeth spring, the most important of the group, by Prof. Fresenius:

ELIZABETH-BRUNNEN, HOMBURG MINERAL SPRINGS.

(Muriated alkaline saline.)

Estimated in parts per 1000.

| Solids. | Grains. |
|---|---|
| Sodium chloride | 9.86 |
| Potassium chloride | 0.34 |
| Lithium chloride | 0.02 |
| Ammonium chloride | 0.02 |
| Calcium chloride | 0.68 |
| Magnesium chloride | 0.72 |
| Magnesium iodide | Trace |
| Magnesium bromide | Marked Trace |
| Calcium sulphate | Marked Trace |
| Baryta | Trace |
| Strontia | Trace |
| Calcium bicarbonate | 2.17 |
| Magnesium bicarbonate | 0.04 |
| Iron bicarbonate (of oxide) | 0.09 |
| Manganese bicarbonate (of oxide) | Trace |
| Nickel and cobalt bicarbonate | Trace |
| Calcium phosphate | Trace |
| Silicic acid | Trace |
| Total solids | 13.98 |
| Carbonic acid entirely free | 1.95 |
| Temperature of spring (10.6° Celsius) | 51°F. |
| Sp. gravity of water | 1011 |

This total of something like 800 grains of solid matter per 115 gallons, about three-fourths of which is common salt, does not show a remarkable mineral water. We have within our own limits many springs of this class, some of them indeed far richer in mineral ingredients. Yet the Elizabeth-Brunnen gives character to a group of mineral waters which have become justly celebrated throughout the civilized world. This is for the reason that to an undoubtedly valuable and useful medicinal agent to start with, has been added a most excellent and thorough *system* of application. The Germans do not question the value of their mineral waters nor the skill and integrity of the medical men who direct the treatment at their spas. As a consequence the results attained are very gratifying. Persons suffering from old and obstinate cases of intestinal catarrh, for example, come to Homburg, surrender themselves to the doctor, observe a prudent régime, indulge moderately in the serene and harmless pleasures of the place, drink the waters—always under instructions—and return to their homes in four, six or eight weeks, restored to health. Such has been the history of Homburg as well as many other continental spas for many generations past. It is not to be wondered at that spa treatment occupies so high a plane in the opinion of the profession as well as of the laity. The diuretic, laxative, antacid and bracing effect of the Homburg waters cannot be fully accounted for by a study of the analysis of the springs. Artificial waters constructed in accordance with the analysis have failed to produce the same physiological effects upon the human system. Possibly the science of "physicalische chemie" may throw some new light on the process of dissociation in saline solutions and the formation of "ionen." Investigation in this direction, however, has hardly passed beyond the point of scratching the surface; while waiting for further light our hard-headed and practical Teutonic friends are going right on enjoying the advantages which Nature has given them and leaving for their savants the task of working out theories and explanations. Very truly yours,

JAMES K. CROOK, M.D.

*Homburg vor d Höhe, July 23, 1903.*

## SOCIETY PROCEEDINGS.

### STATE MEDICAL SOCIETY OF WISCONSIN.

*Fifty-seventh Annual Meeting. Held at Milwaukee, Wisconsin.*

The President, J. V. R. Lyman, M.D., of Eau Claire, Wis., in the Chair.

**Hemorrhage into the Cranial Cavity Following Injury of Skull.**—This paper was read by Dr. Charles H. Lemon. He laid emphasis on the importance of such lesions, due to the peculiar nature of the case. As a result of many experiments a remarkable resiliency of the skull has been demonstrated. The pathology of

cerebral lesions has often been misinterpreted. Those cases which are accompanied by a slow hemorrhage are the most interesting. All tissues undergoing trauma react alike, the peculiar conditions obtaining in the skull causing peculiar symptoms. Injury to the skull, causing unconsciousness, should be carefully watched. The following symptoms point to intracranial pressure: A tendency to sleep, vomiting, twitching of muscles, incontinence of urine and feces, inequality of pupils, loss of reflexes, stupor with or without remission. It is not necessary that fracture have grave or fatal results. In fact, fracture is sometimes a means of reducing pressure and many cases with fracture recover. Even venous sinuses can be torn without fatal results. When infection occurs it may be delayed and death result from pyemia rather than meningitis. In discussing treatment the author condemned depletion and the use of ice bags, etc.

**Retrodisplacement of the Uterus.**—This was the subject of Dr. G. A. Kletzsch. The generative organs are protected by heavy walls and strong fascia. The support of the uterus other than ligaments must not be forgotten. The perineum gives great support while the ligaments hold up the uterus but loosely. The peritoneal reflexion is also a factor. The uterus is not in a fixed position; but the cervix is more or less fixed, the fundus being rarely at rest. The uterus belongs in the true pelvis. Among the causes which disturb the position of the uterus are labor, miscarriage, faulty and too early use of forceps. All of these suggest the importance of prophylaxis. Regarding treatment, slight local operations and long continued local treatment will often prevent the necessity of radical operation. The Alexander operation is ideal for simple displacement without adhesion. Vaginal fixation distorts the position of the uterus, abdominal fixation is not perfect; but is found the best operation available.

Dr. F. Shimonek, in discussion, emphasized the distinction between retroversion and retroflexion, and advocated the use of pessaries in selected cases.

Dr. W. E. Fairfield criticised the use of tight binders and continued dorsal decubitus after parturition as tending to induce displacement of the subinvoluted uterus.

**Presidential Address.**—The president's address dealt with the early history of the society and its present relationship to the American Medical Association. The territorial society recognized the County Society as a unit thus foreshadowing the theory now advocated by the national body. The author quoted freely from Dr. George H. Simmons' writings on reorganization of the profession and urged that the Wisconsin Society fall in line with the work done in many other States.

**The Scientific and Practical Value of Bacteriological Examinations of the Blood During Life.**—This was the theme of Dr. L. Hektoen, Professor of Pathology in Rush Medical College, Chicago. There has been much progress of late in the bacteriological examination of the blood. The proper method is by puncture of a vein at the bend of the elbow under strictest asepsis. Pain is insignificant and there is no danger.

In septic diseases very interesting cultures may be made, and the difference between local infection and general invasion of the blood may be demonstrated. Infection may occur with or without local lesions. This method has a special value with reference to treatment of specific serums. In all cases accurate diagnosis on an etiological basis is absolutely necessary. The bacteriological examinations aid us in prognosis. We find streptococcic cases frequently recovering. Ten per cent. of scarlet fever cases have been found to have the streptococcus in the blood. In pneumonia out of 100 cases, 95 showed the pneumococcus. The prognostic value of such examination is slight. In typhoid fever the typhoid bacillus is found in the blood from the beginning, and reappears with exacerbations. Blood examination is valuable for prognosis, particularly in the presence of epidemics. The typhoid bacillus was found in the blood of three cases of scarlet fever only one of which desquamated. Intestinal lesions of typhoid have no relation to the severity of the attack. The early pharyngeal point of invasion is through the medium of the tonsils. The paratyphoid bacillus has been found on the feet of flies. Many cases in the Ithaca epidemic gave negative results with the Widal test.

**Management of the Mother During Child-bed Period.**—This was Dr. A. D. Gibson's paper. He said raw surfaces of the uterus and genital tract are easy sources for infection. Complete involution of the uterus does not occur for three months and the woman should conduct herself with this in mind. Afterpains are more pronounced if the uterus has been excessively dilated, as by excessive amniotic fluids, etc. The writer opposes the use of the binder as tending to promote retroversion, opposes rupture of the membranes, frequent examinations and the use of douches, regarding the practice of ordering the nurse to give them as little short of criminal. A chill soon after labor is frequent and usually unimportant. The kidneys should be kept active and the lying-in room cool, cooler than is suitable for the child and the best plan is to have separate rooms for mother and child. As to diet, avoid slops. The child should be nursed at once. The bowels should be moved from twenty-four to thirty-six hours after labor with castor-oil or compound licorice powder.

**Shortcomings of the Physician, Particularly in his Relation to the State and Hygiene,** by Dr. Albert F. Fuchs. This paper dealt with the relation of the physician to the community at large with reference to other matters than those directly connected with medicine. The physician's attitude on questions of religion, politics and social questions are of greatest importance and there is much to be desired in the attitude of the profession toward these questions.

**Annual Address in Medicine. The Diagnosis and Treatment of Nephritis,** by Dr. Arthur R. Edwards. Among many other interesting things he said systematic and repeated examinations of the twenty-four-hour specimen of urine should make diagnosis easy; but there are exceptions. The total amount of urine may be decreased in the latter stages of nephritis or in the presence of hypertrophy. Albumin may be absent in individual cases or may be present in excess. Nephritis without albuminuria undoubtedly exists. Casts may be found at intervals when albumin is temporarily or permanently absent. Casts should be searched for even in the absence of albumin. Hyaline casts are found in normal urine; granular and epithelial casts signify degenerative or inflammatory lesions. Casts frequently follow operations and are found in toxemia. Parenchymatous nephritis may have no cardiovascular complications; but dilation or atrophy of the heart may exist. The heart may lead to or follow renal disease or both may be referred to a common cause. Edema in chronic nephritis is often due to permeability of the blood vessels. It is hard to say why some cases are so much more marked than others. Diagnosis of latent atypical non-albuminuric nephritis is especially important if other lesions are present. We must always think of all other possible diseases, and we can often only suspect the presence of kidney complications. Frequently the smaller the urinary the greater the pathological findings at the autopsy. Nephritis has

been found in twenty-five per cent. of autopsies where the kidney lesions had no particular significance during life.

Among the symptoms of chronic nephritis are those of the nervous system, digestive system, failure of the heart, complicating pneumonia, pleurisy, etc. When uremia is present, be sure that other possibilities are excluded. The pulse is important, being slow until complications are imminent, such cases may closely simulate digitalis poisoning. Uremia may simulate almost any brain lesion.

Preventive therapy is of importance, rest and exercise being fundamental. Rest in the horizontal position is good for kidney lesions. Passive exercise is useful if the heart is weak. When improvement occurs vigilance should not be relaxed. Rest in bed protects the skin and relieves vascular tension, and rest should be continued often for a year or more. Physical rest is of prime importance; after mental fatigue violent exercise should be avoided. The diet should be non-irritating;—limit albuminous foods; give fats and carbohydrates freely. Avoid albuminous foods because they must be eliminated by the tubules. Do not diet too much on general principles, if the patient loses weight the diet should be altered. Few patients cannot take milk, if it is taken as food and not as a beverage. Avoid tea, alcohol, coffee and spices. For the edema, diuretics are recommended; but are unsatisfactory. Do not allow catharsis to interfere with the weight. Sweating eliminates fluids rather than solids; causes too much concentration of the blood, and favors uremia. Mechanical removal of fluids is better, a deep incision (3 inches long) in the leg will often bring from one to three gallons of fluid containing .2 per cent. of urea. This urea is thus removed from the circulation directly. In the last stages the heart is the main feature. Avoid irritation and overstimulation. Hypertrophy is a favorable condition; but it only postpones the fatal issue.

**Indigestion; A Few of its Causes and Effects.**—This paper was read by Dr. H. B. Sears. He said any break in the complex chain of digestion ruins the whole. Environment plays a large rôle. Early detection of indigestion is of great importance. Too many members of families, varying in age, eat the same kind of food without discrimination. Haste in eating is the most fruitful cause of indigestion; poor teeth are scarcely less to blame. Insufficient cooking is the bane of the American stomach; for instance, beans should be boiled ten hours and then baked five hours in the oven, a process which it is hard to induce American cooks to agree to. Children under ten years of age are better without meat. All cases of indigestion should be treated individually and no general rules can be laid down.

**Semilunar Cartilages, Their Anatomy and Surgery.**—Read by Dr. H. A. Sifton. This paper dealt with the anatomy of semilunar cartilages; and various forms of displacement which may occur and the treatment both operative and otherwise. The importance of rest was emphasized and the use of passive motion; and especially the necessity for restricted motion for a long period.

**Sequelæ of Adenoids.**—This was the subject of Dr. C. D. Conkey. He said that adenoid growths are a disease of childhood and generally pass away with adolescence; but the effects remain. Deformities of the nose and even of the jaw may result from neglected and excessive adenoid growths. There may be arrested development of the bones of the face. The chief trouble comes from prolonged mouth breathing which at once disappears after the growths have shrunk. Hypertrophic catarrh, affections of the ear, tonsils and often larynx and bronchial tubes are some of the unfortunate and often permanent results of a comparatively insignificant affection.

**Significance of the Perforating Wounds of the Eyeball.**—Read by Dr. J. A. Bach. Aside from the direct results of injury to the eyeball, which are to be treated on ordinary surgical principles, our chief care should be directed toward the avoidance of sympathetic ophthalmia. The old theory, which has been largely discarded, is again coming into quite general acceptance, namely, that sympathetic ophthalmia may develop without infection. Ciliary reflex plays a large rôle in the development of sympathetic ophthalmia and our chief care should be to avoid all possible sources of irritation.

**Diagnosis of Hysteria.**—Read by Dr. Hugh T. Patrick. This paper dealt with cases of hysterical anesthesia following trauma. Our chief diagnostic point in distinguishing hysterical anesthesia lies in the fact that the line of demarkation is so sharply defined and fluctuating, being found to vary on repeated examinations. Great care should be exercised to detect the presence of other diseases coexisting with hysteria.

**Prostatectomy.**—This paper was read by Dr. T. W. Nuzum. He summed up as follows: (1) Prostatectomy is an operation destined to give great comfort to patients suffering extreme pain; (2) the perineal route is the best; (3) the operation is warranted even in advanced old age; (4) weeks should be given in preparation before the operation; (5) the horseshoe incision is the best; (6) the greatest danger lies in hemorrhages, especially if due to sclerotic arteries; (7) the results are encouraging considering the bad conditions under which such operations are generally done; (8) better technic will bring better results.

**Post-mortem Degeneration of the Pancreas.**—Paper read by Dr. Wm. F. Becker. He advanced the theory that microscopical examination of the pancreas may under some conditions give decisive evidence as to the length of time which has elapsed since death has occurred and may prove of value in medicolegal questions. The pancreas is a valuable organ for such examination, owing to its comparative freedom from disease and its protected situation in the abdominal cavity. Many factors must be considered in drawing conclusions from the post-mortem appearance of the pancreas, such as temperature surroundings following death, length of time after the ingestion of food, etc. In support of his theory numerous microphotographs showing the pancreas at varying intervals after death demonstrated the different way in which degenerative processes occur in the different histological structures of the gland.

**Albuminuria in the Apparently Healthy.**—This was the subject of Dr. W. H. Washburn. He reported the histories of 258 cases of albuminuria discovered in supposedly healthy persons applying for life insurance examination. Thirty-five of this number showed evidences of disease such as cardiac murmurs, casts, cystitis, etc.; eleven of these cases are dead from unknown causes, 70 have been lost sight of. Out of the 153 remaining cases 6 have died, 2 from pulmonary tuberculosis, 1 from pneumonia, 1 from paralysis, 1 from acute Bright's disease and 1 without a diagnosis having been made. The mortality among these cases, if we make allowance for the 35 mentioned, is smaller than would have been expected. Out of 100 cases due to albuminuria only 14 still show albumin. The evidence shows that the treatment instituted appeared to be very beneficial. No one line of treatment, however, was pursued in all these cases.

**Annual Address in Surgery.**—This was delivered by Dr. William J. Mayo, of Rochester, Minn. The

author presented conclusions drawn from a study of 900 cases of operations in the upper abdominal cavity. There is a close relation between the affections of the gall-bladder, bile passages, stomach and duodenum. The duodenum acts as a sort of buffer and is secondarily attacked: the same is true of the pancreas. Abdominal surgery owes much to pelvic surgery. Mistakes there have helped us later in gastro-enteric work. Surgery of the stomach has had to live down a bad name. The stomach is one of the most favorable organs for operation, and the chief difficulty lies in the diagnosis. Ignorance breeds complexity and at least half of our stomach diseases must go. The author states that out of 1,100 cases, where careful examination was made of the stomach contents and the position of the organ, 300 were operated and the diagnosis found correct in 80 per cent. Chemical examination of the stomach contents is often negative and should not be too greatly relied on or cause us to delay too long before operating. Exploratory incision is indicated in all doubtful cases. To get an outline of the stomach, a stomach tube and ordinary Davidson syringe are sufficient. Refinements of technic are found harmful. Simple methods give enough to warrant sending the patient to the surgeon for treatment.

**Ulcer.**—Do not confuse acute and chronic symptoms, pains exist chiefly in old ulcers only; the nearer the pylorus the greater the pain. Ulcers of the duodenum give symptoms resembling those of gall-stones. Pain may disappear for some time and hemorrhage and vomiting are rare and late. Cure may result from rest, but the ulcer may return. Out of 500 cases in a London hospital, 211 had previous attacks, 18 per cent. died, 42 per cent. are doubtful cures, most of these cases are surgical. Ulcer is often diagnosed as cancer. Chronic ulcer is a disease of adult life. Drainage operation gives marvelous results. Two hundred cases show the ulcer mostly to the right of the pylorus on the great curvature, then there is great pain from pyloric spasms. Surgical treatment is not settled. Excision of the ulcer is found feasible, but it is often hard to find. Redmond has suggested excision of the pylorus, the so-called "ulcer-bearing area." Dilation without organic trouble, where there is no retention and little stagnation, is not much benefited by operation; this is true also of gastroptosis. Beware of neurasthenic stomach.

**Cancer of the Stomach.**—Early diagnosis and operation are very necessary. In five years operations for cancer of the stomach will give as valuable results as are obtained in cancer in the breast. Return of the disease is more often found in the liver than in the stomach on account of the blood and lymph supply.

**Ethyl Chloride as a General Anesthetic.**—This was Dr. Franz Pfister's paper. He said that only pure ethyl chloride must be used; no methyl chloride must be present. The preparation called kelene has been found to be reliable. Failure and accidents have been due to impure drugs and faulty administration, the results are good, as there is an absence of unpleasant by-effects. The use of ethyl chloride is limited to minor surgery. Patients should be prepared as for other forms of anesthesia, a cone may be used as for nitrous oxide, tight over the face or it may be sprayed on a double layer of gauze. From 5 to 20 c.c. will produce anesthesia for ninety seconds. Anesthesia may be maintained from six to ten minutes; pupillary and conjunctival reflexes are all that need to be watched; dilation of the pupil is a danger signal; breathing is slightly stertorous. Previous hypodermatic injections of morphine are recommended.

Dr. Thienhaus, in the discussion, stated that Kocher has rejected the use of ethyl chloride and reports 7 deaths in 17,000 cases.

**Diagnosis and Treatment of Some of the Inflammatory Conditions of the External Ear.**—Read by Dr. Gilbert E. Seaman, who said that catarrhal inflammation of the external ear is a misnomer, as there is no mucous membrane in the external ear. Furunculosis should be treated early, and is a very painful and troublesome affection; the nearer the tympanum the greater the pain. Recurrence is very frequent. Treatment on ordinary aseptic lines; incision under local anesthesia and the use of a 50-per-cent. solution of argyrol. Eczema is very difficult to treat, care should be given to hygiene, diet, use of laxatives, avoidance of soap and water and thorough removal of crusts, débris, etc. Spray with peroxide of hydrogen, or yellow oxide of mercury 2 gr. to the ounce, as also oil of ergot.

**Septal Deflections.**—This interesting paper was read by Dr. F. T. Nye, who said that septal deflections may be classified (1) as simple, (2) deflections with excess of tissue, (3) deflections with slight or partial excess. Etiologically they may be classified as due to congenital malformations or traumatism. As a result we have imperfect respiration, pharyngeal and laryngeal, and imperfect drainage from accessory sinuses. Both speech and smell may be affected. The treatment is chiefly surgical. The floor of the nose must be depressed, redundant tissue must be removed, the septum must be readjusted and maintained in position. Cocaine and adrenalin solution are indispensable. The writer prefers a blunt punch for operations on the septum, sterile gauze may be used for the first twenty-four hours, followed by a splint.

**The Practice of Obstetrics.**—This was the title of Dr. E. F. Fish's paper, who said the importance of strict asepsis and careful after-attention cannot be too greatly emphasized. Too much obstetrical work is left for the younger and inexperienced physician, older physicians avoiding this class of work partly on account of inadequate compensation. Examinations should be as infrequent as possible, douches should be avoided and the case be considered as strictly surgical.

This paper was very elaborately and thoroughly discussed by Dr. Scollard and others, and in the matter of examination and the position by outside manipulation many differences of opinion were brought forth.

**The Depurative Functions of Organs.**—Read by Dr. C. R. Brown, who remarked that all life is at first referable to a single cell. Differentiation arises first as a sort of inflammatory reaction, it is Nature's response to outside insults. Inflammation is only a natural process exaggerated. The location of inflammation is of great importance. Edema of the hand is quite a different thing from edema of the glottis; inflammation of the finger is a different thing from inflammation of the appendix. The lungs, liver, etc., have functions other than the conventional ones of the organs, these are of a depurative nature, for instance, the liver is well known as an important agent for the arrest of poisons. The lymph system also plays an important part, and this is true of the ductless glands. Tonsillitis is not due to a specific microbe; many bacteria can cause tonsillitis, and disease is often arrested by the tonsils with resulting inflammation of these organs and no further bodily invasion. The Klebs-Löffler bacillus may cause merely a simple tonsillitis and the general system escape diphtheria. The author reported and analyzed several interesting cases.

**Myomectomy of Uterine Fibroids.**—This paper was read by Dr. A. J. Puls, who said that myomectomy is recommended in younger patients who have not reached the menopause. It is in accord with the general principle that all healthy tissue should be left, it is particularly recommended for fibroids because return of

the disease is not common, and not so grave as in the case of malignant disease.

**Surgical Progress.**—By Dr. W. H. Earles. The author reviewed the progress of surgery during the past year, calling attention to the notable progress being made in gastro-intestinal work, prostatectomy, etc.

**Manifestations of Rheumatism in Infancy and Early Childhood.**—This most interesting subject was introduced by Dr. Arthur T. Holbrook, who said that great confusion in terms and much progress is needed in accurate diagnosis. The cause of rheumatism is an accumulation in the blood of something which irritates; especially irritating to the synovial membranes. Both the uric acid and the lactic acid theories have been refuted, and we are still in the dark. Acute articular rheumatism is rare under three years of age, the cases of grip, etc., are often misnamed rheumatism. Temperature in children with rheumatism does not often run high. Joint swellings are slight and not many joints are affected at once. Heart involvement is so common as almost to be a symptom rather than a complication. Eighty-three per cent. of cases under ten years have heart symptoms. Peculiar heart sounds often accompany involvement of that organ; there is a sort of dulness or muffling, a "murmurish" sound. Subcutaneous fibrous nodules are often found about the joints and tendons in children. Diagnostic points are heredity, history of previous attacks, and general clinical picture; exclude the following: multiple neuritis, tuberculosis, syphilis, scurvy and "growing-pains." The danger in rheumatism comes almost always from the heart.

**New Officers.**—The following officers were elected: President, Dr. F. E. Walbridge, Milwaukee, Wis.; First Vice-President, Dr. James Mills, Janesville, Wis.; Second Vice-President, Dr. C. C. Galiot, Shullsburg, Wis.; Secretary, Dr. C. S. Sheldon, Madison, Wis.; Treasurer, Dr. S. S. Hall, Ripon, Wis.; Delegate to the American Medical Association, Dr. Evans, La Crosse, Wis.

The Society adopted the constitution and by-laws recommended by the American Medical Association, thus following in line with the majority of the States of the union. Seventy-eight members were added to the membership of the Society, and it is expected that during the coming year County Societies will be organized throughout the State. A committee of ten was appointed to serve as temporary council until organization throughout the County shall have been completed.

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## THE MEDICAL SOCIETY OF THE COUNTY OF NEW YORK.

*Regular Monthly Meeting, held June 3, 1903.*

The President, Charles N. Dowd, M.D., in the Chair.

The scientific business of the evening consisted of the reading by Professor Ewald, of Berlin, of a paper with the title On Stomach and Intestinal Crises.

**Abdominal Pains.**—Professor Ewald said that there are many causes of pain in the upper abdominal region that must not necessarily be referred either to the stomach or the intestines. Renal colic is not infrequently localized in the upper part of the abdomen and is not always referred to the part or the kidney affected. It has often been noted that renal calculi when forming are apt to give a sense of acute discomfort in the upper part of the abdomen on either side. Gall-stones in process of formation give rise to pain of the same kind, which not infrequently is localized in the right epigastrium as if it were the result of stomach or duodenal conditions. Pancreatic calculi are usually rarer and the pain is commonly referred to the other side, but the possibility of their occurrence must not be forgotten or serious mistakes may be made, especially as pancreatic operations are indicated as early in the case as possible, and physicians should recognize them before complications have occurred, if possible.

**Stomach Pains.**—There are many causes of pain in the stomach itself besides the gastric crises which are referred to degeneration of the sensory tracts of the cord. Ulcer of the stomach may give rise to severe pains of burning character, though the differential diagnosis is usually not difficult if the physician secures a good history of the case or finds a point of localized tenderness in the abdomen just over the region of the ulcer. True stomach pain may also be due to spasm of the pylorus. This is not frequent, but its occasional occurrence can scarcely be denied. This type of pain is a true colic, being due to a spasmodic contraction of a mucous-lined canal. Intestinal worms may at times give rise to painful conditions referred to the stomach or duodenum, probably consequent upon the wandering of the parasite into the upper part of the intestinal tract.

**True Gastric Crises.**—One of the most interesting forms of pain in the upper abdomen is due to the occurrence of stomach crises in what is known as locomotor ataxia or tabes dorsalis. These cases have only been recognized in their true character in comparatively recent years, but they form at the present time an important part of the work of the specialists in diseases of the stomach. In the last ten years Professor Ewald has seen 89 cases of the affection, but he has the notes in detail of only about 50 of the cases. These details are, however, sufficient to give a very good idea of the frequency of the affection, of its probable etiology, of its peculiar symptoms and course, and of the treatment that has sometimes been found effective.

**Syphilis as Cause.**—The first question that naturally arises is how frequently can syphilis be found in the history of these cases. Out of the 50 cases, 26 either confessed to syphilis or showed traces of syphilitic lesions. This is about 60 per cent. of the number, and this percentage is about what has been found by neurologists in the history of tabes generally. In some of the cases the primary and secondary lesions of syphilis were more than ten years past. Usually a number of years had gone by since the last signs of any syphilitic lesion had been seen. Not infrequently the gastric pain was the first symptom of the beginning of tabes dorsalis. Sometimes other symptoms, especially those in the eyes or in the station, the so-called Romberg symptom could be found on careful examination, though the patient had known nothing of their existence before the attack of pain.

**Duration of the Disease.**—In some of the patients under Professor Ewald's care the gastric crises continued for more than ten years. The average length of the cases is about three years. One patient had his first attack of tabes only two months before he came under observation. The attacks recur at intervals. At first these intervals are long, sometimes there is no recurrence for over a year or even two years. Then the intervals become shorter until finally the gastric crisis is repeated every week or two. The attack of pain lasts from one-half hour to forty-eight hours. Very few cases get any relief for at least several hours after the beginning of the attack. The pain is localized in the epigastrium and the preliminary sign of the attack is a causeless nausea followed by vomiting. The vomit consists at first of food and then mucus, followed by blood in streaks. Twice Professor Ewald has seen the vomiting of blood accompanied by melena. This is rare, however, and is probably due to the rup-

ture of small blood-vessels during the efforts at vomiting.

**Character of the Attack.**—The pain usually comes on very suddenly and is described by the patient as lightning-like in character. At times, however, there is some warning of it in a sense of discomfort. This is a sort of aura in the chest and back. Gradually then the pain becomes worse until finally it takes on the cramp-like character of a true colic. There is usually a feeling of intense constriction around the waist. Vertigo occasionally accompanies the affection. Once Professor Ewald saw a true fainting spell that lasted for some time and seemed to have no other cause besides the irritation of the gastric nerve endings.

**Pre-ataxic Symptoms.**—Not infrequently these gastric symptoms occur for a long time before any characteristic ataxic symptoms can be discovered. There may be absolutely no difficulty of locomotion or station. In one of Professor Ewald's cases five years passed before the other symptoms of tabes became noticeable. In several cases more than a year of absolute freedom from any other tabetic symptoms was noted. The gastric pain is not accompanied by any definite invariable pathological change in the stomach contents. The most frequent change noted was a certain amount of subacidity. This seems to be due to a lowering of the activity of stomach functions generally. In the interval between the attacks the stomach contents show no signs of the condition. Usually the patient is quite comfortable as regards his gastric function, but at times there is a continuous dyspepsia of nervous character and likely to have anomalous symptoms. The diagnosis of the condition then must be made rather from the sudden and lightning-like attacks of the pain and the associated symptoms than from any information that can be obtained from the stomach.

**Rectal and Anal Crises.**—Intestinal crises are ever so much rarer than stomach crises. They occur usually in the rectum and anus. Intestinal crises of any kind are accompanied by board-like hardness of the abdomen, due to a tense contraction of the abdominal muscles occasionally with protuberances of parts of the wall because of spasm of the intestines situated directly below. Not infrequently gurgling sounds may be heard and after these the protuberances disappear. Usually these phenomena are followed by an intestinal movement and, as a rule, do not last long. Anal crises are accompanied by intense desire to go to stool which cannot be satisfied. Patients describe their sensations as being excruciatingly painful, as if a hot iron were being pushed up their rectum. Commonly these do not last long and then the patient is as well as ever. As with regard to gastric crises, the intervals between the attacks are likely to become shorter and the patients suffer obstinately and without much hope of relief until the further degeneration of nerve tracts destroys the sensory paths.

**Diagnosis of Gastric Crises.**—The diagnosis depends upon two elements, the previous history and the tearing, lightning-like character of the pain. When the attack occurs for the first time, diagnosis is extremely difficult. There is likely to be the thought of some serious intestinal condition, as obstruction or some intensely acute gastritis. Frequently when the vomiting is continued during the course of an attack it is difficult to separate it from functional nervous vomiting. There is a condition of periodic vomiting entirely neurotic in character, which occurs and may simulate a gastric crisis. Idiopathic vomiting as described by Leyden, that is recurrent attacks of vomiting without any gastric pathological conditions and without any nervous involvement must also be differentiated. This condition is not very frequent, however, and the attacks are neither so violent nor so sudden in their onset and the patients are usually of neurotic family and personal antecedents.

The pernicious vomiting of pregnancy is, of course, well known and, as a rule does not require very careful differentiation from tabetic crises. It must not be forgotten, however, that women suffering from the beginning of tabes may become pregnant and that vomiting during pregnancy therefore does not always mean reflex vomiting from uterine stimuli. Stone in the kidney or biliary passages may give rise to distinct spasms of pain accompanied by vomiting. These may be recurrent in character and thus give rise to the suspicion of tabes. Serious mistakes may be made in this matter, especially as surgical intervention in biliary and other conditions should be undertaken early to be successful and the stomach specialist is expected not to allow the diagnosis to remain undecided too long.

**Mistakes of Diagnosis.**—There are a number of reported cases in the literature in which gastric crises were mistaken for other conditions, to the serious detriment of the patient. Werner reported a case in 1883 which, owing to the existence of pregnancy, was considered to be reflex vomiting, but after the uterus had been emptied the cervix thoroughly dilated and the interior cauterized, the attacks continued to recur. The painful seizures were then considered to be due to spasm of the pylorus and the attacks were supposed to be due to attempts of the stomach to pass along its contents through the contracted pyloric orifice. Accordingly a gastro-enterostomy was advised and after some delay was performed. Absolutely no effect was produced and the attacks continued to recur. The old theory that the condition was due to reflexes from the uterus was then taken up again and the patient's uterus and ovaries were removed. This procedure was also without good effect. Three years later the patient developed other signs of tabes and it became evident that the whole set of symptoms had been due to the degeneration of the cord and associated neurons.

**Causes of Gastric Crises.**—The true nature of the tabetic crises is as yet in the dark. It has been supposed that the degenerative process caused by the sclerotic condition affects the nucleus of the vagus and the ganglia associated with it. After complete degeneration has taken place the attacks cease and it is usually true that as the tabes progresses the attacks become less frequent and less bothersome and finally disappear entirely. This theory would not explain the gastric crises which precede all the other signs of tabes. For these the theory has been suggested that there is an irritant toxin in the blood of patients who have suffered from syphilis and that this causes an irritative degeneration of nerve substance with consequent production of attacks of pain in sensory nerves and vomiting because of the effect on the vagus which is connected reflexly with these and is distributed to all parts of the stomach.

**Treatment.**—Unfortunately with all our knowledge of the affection there is very little that can be done for the patients either during an attack or in the interval between attacks. There is no known means of surely shortening an attack. Various coal-tar products, especially antipyrin have given good results in certain hands, but have proved of no service to others at all. Morphine sometimes does good, but sometimes fails utterly to give relief. Where vomiting is a prominent symptom and more annoying than the pain, cerium oxalate has been known to do good, though in Professor Ewald's hands it has not proved of very great benefit. In the intervals between attacks strychnine has been recommended and, according to conservative observers, has been known to lengthen the time be-

tween attacks and to make succeeding attacks less severe than those that have preceded the administration of this treatment. It is evident that suggestion plays an important rôle in the treatment of the condition, since each new method that is invented does some good in the hands of the physician who originally suggests it. Morphine remains the drug to be depended on, but it must be increased very much in successive attacks in order to have a satisfactory effect. Professor Ewald has seen cases in which large amounts of morphine were employed with only a modicum of satisfaction. One-third to one-half grain of the drug may be given repeatedly at short intervals and only produce slight alleviation of the symptoms.

**Spinal Anesthesia.**—Dr. Corning suggested some years ago the use of injections of dilute solutions of cocaine into the spinal cord with the idea of producing spinal anesthesia. This suggestion was taken up by French surgeons and has now been employed sufficiently often to make it clear that there is very little danger associated with it. In the hands of certain observers this method has done more to relieve the pains of gastric and intestinal crises than any other. Where the crises recur frequently and where all the ordinary drugs fail to give much relief, this method of treatment should certainly be employed. Nothing is more discouraging than to see the remedies so often recommended fail one after another to give relief in the intense tearing pains which accompany gastric and intestinal crises. As closely related to intestinal and gastric crises, Professor Ewald considers that the tearing pains which sometimes affect the bladder in the course of tabes should also be mentioned. As in the corresponding anal crises, there is apt to be an intense desire to empty the viscus, which cannot be satisfied and the patient describes his feelings as being so excruciatingly painful that there is the impression of a red hot iron being forced through the urethra into the bladder. These are even more obstinate to treatment than are the intestinal crises and the method of spinal anesthesia seems specially indicated. Ordinary anodynes often fail entirely to have any effect and patients live in constant dread of the return of the awful pain. This is of itself sufficient to make their condition more miserable than it would otherwise be and probably also to shorten the intervals so that the physician should not hesitate to employ so apparently serious a remedy.

**Idiopathic Crises.**—There are a certain number of attacks of intense pain that occur in the abdominal region referred to the stomach or intestines or to the bladder that simulate the crises of locomotor ataxia yet have no connection with the disease. At least none of the characteristic signs of true tabes ever develop to make the diagnosis assured. These cases often yield to treatment by tonics, or by high irrigation. Needless to say in all cases ordinary methods of treatment by irrigation, washing out the stomach and the rectum and large intestine and also the bladder, must be tried before recourse is had to large doses of anodynes, or to the method by spinal anesthesia.

**American Universities and Hospitals.**—Professor Tillmanns, the distinguished German surgeon was then introduced and said that his visit to America had proved to him what magnificent work was being done in the universities and hospitals of this country. He feels that he is leaving the American shores a better surgeon than when he came. German students of medicine will have to come more and more to this country if they want to appreciate the progress that is being made by an enterprising people in the practical sciences and especially in the department of surgery. The hospitals of this country particularly are worthy of all praise and are models for the world. Professor Tillmanns considers that he will always look back with the greatest pleasure on his visit to America and that he will feel the necessity for coming back again ere long in order not to miss any of the good work that is being done here.

**Germany and American Medicine.**—Dr. D. B. St. John Roosa said that in the early colonial days American medicine received its encouragement and the aid in scientific matters from Amsterdam. The first physicians who came to New York were pupils of the school of Boerhaave, of Leyden. After this the main influence in medicine came from Edinburgh. Munro's and Syme's influence were deeply felt by New York physicians and surgeons and as the country improved more and more physicians were enabled to go to study under their special care. Later France took the place of alma mater for American medical students and held it for many years. At the end of the first quarter of the century Laennec and a little later Nélaton and Trousseau were the masters in medicine to whom American medical students owed very much. It was only in the last quarter of the nineteenth century that Germans and German medical methods came to have the influence now so prominent in American medical matters. Roosa himself was one of the first to go to Germany before going to France for medical studies. On his return he translated several German works on the eye and ear into English. After 1870 German medical works began to be translated into English and it was not long before Virchow and others were the names most familiar to American medical students.

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## THE MEDICAL ASSOCIATION OF THE GREATER CITY OF NEW YORK.

*Stated Meeting held at the New York Academy of Medicine, June 8, 1903.*

Ransford E. Van Gieson, M.D., in the Chair.

**Anesthetics.**—The first paper of the evening was by Dr. Edward Wallace Lee, on this subject. Speaking of spinal cocainization, he said that his experience with this method was limited to 15 cases, 12 of which were surgical and three obstetrical. In the latter it was not at all satisfactory, the injection apparently losing its anesthetic effect just at the time required, while the patients suffered from its unpleasant effects, nausea and extreme nervousness. In the surgical cases there was one abdominal section for tubo-ovarian abscess. The incision was made without the least distress to the patient, but when he inserted his fingers into the abdominal cavity she grew restless and highly hysterical. A loop of intestine presented itself in the wound, which, unfortunately, the patient saw. She became maniacal, and it was necessary to complete the operation under chloroform narcosis. In the other cases the results were fairly satisfactory, but not sufficiently brilliant to cause him to resort to spinal cocainization when any other form of anesthetic could be used with any degree of safety.

**Ethyl Chloride.**—For minor surgical procedures Dr. Lee has found this substance very satisfactory as a local anesthetic.

**Cocaine Local Anesthesia.**—The local and hypodermatic administration of cocaine he has found of very great service in innumerable instances. The following are the principal indications for its use: (1) A short operation; (2) no especially sensitive structures to be incised; (3) the ability to bring every part involved in the operation under the influence of the cocaine. (4) In patients whose condition of extreme exhaustion is such that the additional shock of a general anesthetic

would take away their only chance of life. When cocaine was first introduced he used it locally on mucous membranes, as in the nose, throat, mouth, vagina, rectum and penis, with good results as far as the anesthetic effect was concerned; but he soon discovered that he was employing it too freely and in too strong a solution, as it produced serious constitutional disturbances. Two cases were almost fatal, and these he described in detail. He has made several abdominal sections under the use of cocaine with gratifying results, and has employed the infiltration method in hernia and appendectomy. His most satisfactory results with cocaine as a local anesthetic have been on the extremities. Here he has made amputations, removed growths, curetted ulcers, ligated vessels, sutured wounds, etc. In his experience, if the extremity be elevated until gravity has quite blanched the member, and an Esmarch's bandage is then applied, local anesthesia has a wide range of usefulness and the patient does not suffer from such severe constitutional disturbances as when the cocaine is permitted to enter the general circulation.

**Suggestion and Deception.**—In a few instances Dr. Lee has been able to perform minor and superficial operations by assuring the patient that the part to be operated upon was not susceptible to pain; also by allowing the patient to believe that he was using a powerful local anesthetic, when nothing but sterile water or alcohol was employed. In a very few cases he has succeeded in placing a patient in a hypnotic state sufficient for a minor operation. One case in illustration of this was given.

**General Anesthesia.**—General anesthesia is to be performed in all cases where there is not some good and sufficient reason to contra-indicate its use. A feature of it which is one of its greatest advantages, but which is too little appreciated, is that blessed oblivion which envelops the patient throughout the operation. He has not been favorably impressed with the various combinations of ether and chloroform, preferring to use one or the other alone. Occasionally it may be advisable to discontinue the one and substitute the other, but even this does not seem to have many indications.

**Comparative Merits of Ether and Chloroform.**—So far as safety was concerned, Dr. Lee said he was well aware that ether has the preference. It is its reputation for this which has made it the popular anesthetic, especially here in the East. Personally he has never seen a death from chloroform, while he has had two deaths which could be directly attributed to ether. Ether certainly has many disagreeable features: length of time required; quantity used; struggling stage of excitement; irritating effect on the respiratory tract. Moreover, it is almost invariably followed by nausea and vomiting. Its effects last for several days, the patient complaining of smelling and tasting it. It is also highly inflammable, a factor which generally precludes its use in obstetrics. He considered ether more dangerous than chloroform in Bright's disease, diseases of the respiratory tract, and grave vascular diseases. As a result of his own personal observation, he was prejudiced in favor of chloroform. While serving in 1880 as assistant to Donald Maclean, then Professor of Surgery in the University of Michigan, he administered it about five hundred times, not meeting with any unfavorable complications which would alarm him or discourage him in its use, and since then he had continued to employ it. From his personal experience he could not look upon ether as the safer of the two. Of late, however, he had to confess that he had become more tolerant to ether. In a number of cases it had been administered for him, preceded by nitrous oxide gas, by Dr. H. W. Carter, with very satisfactory results, though at the same time he still noticed many disagreeable features attending its use. The proper administration of any anesthetic requires an expert; especially is this true of ether. Chloroform is the anesthetic to be used in operations about the head, face and neck. Here the cumbersome apparatus employed for ether will be in the operator's way and moreover the field of operation is liable to become infected. With a Junker's inhaler chloroform vapor can be administered through a nasal or tracheal tube, and the operator is not interfered with. In operations about the thorax and abdomen also he thought chloroform preferable, because the respiratory movements were not so much disturbed as when ether was used. He did not believe that death from chloroform was so sudden that there was no time to resort to restorative measures, as often stated. He had seen many cases, however, in which a fatal result was undoubtedly averted by the prompt recognition and treatment of unfavorable symptoms, such as extreme pallor, shallow respiration, cessation of capillary oozing, diminished force of the heart's action, and dilated and inactive pupils. He had never been careless with chloroform. He knew its dangers, and had taken every precaution to avoid them. In nervous, frightened and exhausted patients and in alcoholics he had frequently thought it advisable to give morphine and strychnine subcutaneously preceding the anesthetic.

**The Relation of the Anesthetist to the Patient and to the Surgeon.**—This was the title of a paper by Dr. S. Ormond Goldan. He was firmly convinced, he said, that not until the anesthetist is fully recognized by all concerned as entirely separate from the surgeon, would anesthesia ever advance. When we come to consider his relation to the patient, we are met by the superficial assertion that there is no relation whatever between the two, and that the anesthetist is simply the assistant of the surgeon. If the necessity for the operation did not exist, it is contended, there would be no need for the surgeon; but to this it may be replied that without the anesthesia many lives would be sacrificed and all major work rendered largely impossible. Furthermore, it is argued that the surgeon has always assumed the entire responsibility for the operation, and that usage makes this condition of affairs correct. It is, however, precisely this assumption of responsibility, to which the surgeon has no right and which should not be expected of him, that has delayed the recognition of this important branch of medicine. As to usage, this has constituted the only excuse for some of the most outrageous customs in existence. A division of the responsibility, Dr. Goldan believed, afforded added security to the patient, while it was also just to the surgeon, who thus had the assurance of a cooperator of greatest potentiality in the success of his operative work and the patient's return to health. This direct relation of the anesthetist to the patient entails a proper examination of the patient by himself, and by such examination valuable points in reference to the anesthesia are often discovered. The selection of the anesthetic and method of administration, which from the nature of the case must be varied, should be largely the anesthetist's province. His direct relationship to the patient naturally obliges him to take every precaution during the administration, and, in addition, to be ready with measures for the treatment of shock. It has always seemed to him that anesthetic and surgical shock are so closely related that it is the duty of the anesthetist to be prepared to combat shock, no matter in what form it is manifested. The safe completion of the anesthesia, the minimizing of its after-effects, and the subsequent good condition of the patient must be intensely satisfactory to the an-

esthetist, as it is to the surgeon. The relation of the anesthetist to the patient being direct, he receives what he is justly entitled to, and no more; the full credit for his own work and a fee in accordance. As to the relation of the anesthetist to the surgeon, Dr. Goldan said that he had early recognized why anesthesia occupied such an inferior position, this being simply a question of fee. Any measure having for its object the greater safety of the patient and the more successful outcome of the operation was heartily endorsed by the profession, but not so a corresponding increase in fee. The customary fees for years previous were all for the surgeon, practically nothing for the anesthetist. Who fixed the anesthetist's fees? Certainly not himself. The idea of fixed fees must have been on a par with the belief, so long prevalent, that any one could give an anesthetic. As surgeons' charges are not fixed, there was no moral or legal reason why those of the anesthetist should be. As for himself, when asked as to this point, his reply was that his fees are from no charge in appropriate cases to anything the circumstances of the patient could justly afford. To fix an invariable charge for the surgeon would be as unjust as it would be impossible—the same practice must obtain with the anesthetist. It is a fact that the surgeon's charges are based principally on the financial standing of the patient. Considering the amount of work done gratuitously by the great mass of practitioners, it was his belief that the medical man is entitled to a maximum fee in every case treated. As, however, this in many instances would be a burden to the patient, the practitioner follows the beneficent plan of making his charges in keeping with the latter's circumstances. He does not overcharge the rich, but undercharges the poor.

In all cases operated upon the ethical responsibility is the same for the anesthetist as for the surgeon. From every standpoint, indeed, the two are upon an exact equality. This must be recognized sooner or later, and the signs of the times indicate it now. He had also realized at an early day that to practice anesthetization to the exclusion of other work involved an incompatibility of practicing medicine generally. If not, there must be for the anesthetist a sacrifice of principles and self-respect for the so-called patronage of the surgeon. As long as the operator can use the anesthetist to magnify his own work and minimize the other's, just so long will he continue to give him work, as he calls it. While, however, "any one can give an anesthetic," so can any one operate; but results secured in anesthesia, as in operation, depend much upon the man. Frequently in his experience the physical condition of the patient had been so poor that only by the variation of the anesthetic and the most painstaking care could the operation have been successfully concluded, and he was quite sure that in a number of instances it was only by the extremest attention to details during the conduction of anesthesia that the patient's life had been saved. He preferred to confine himself to medical work in which his individualism was not sunk in that of another, and therefore when any agreement to conduct an anesthesia was entered into by him, it was only when the principles indicated in this paper were subscribed to.

Many surgeons lose sight of the fact that the anesthetist by education and training is his professional equal. The anesthetist exerts his energies to secure a featureless narcosis, the surgeon his for a successful operation; both of necessity working hand in hand, the patient's welfare being the chief object sought. Having gained this, their relation ceases, the anesthetist and the surgeon's relations being then directly with the patient. Dr. Goldan said he had been accused of endeavoring to make anesthesia of too much importance. To this accusation he pleaded guilty. He had always urged the importance of this subject, but consistently as regards every phase of it. Could too much importance, be asked, be given a subject so intimately associated with life itself, as anesthesia was? Many of his experiences as a specialist in anesthetics had been as instructive as they were entertaining, and what was most singular, they were often with those who prated much about ethics—ethics for others, but not for themselves. Similar experiences had been met with by others in all parts of the country from whom he had had communications. In conclusion he said he desired to express his appreciation to those practitioners who during their cooperation with him had shown that they had a proper conception of this subject.

**Cocaine Anesthesia.**—Dr. E. D. Fisher thought that spinal cocainization should be resorted to only in cases in which special circumstances contra-indicated other forms of anesthesia. In fractures of the spine, in which it would have been dangerous to practise subarachnoid injection, he had seen good results from the local injection of cocaine.

**Hypnotic Anesthesia.**—Personally Dr. Fisher's experience was against the use of hypnotism for anesthetic purposes. In one case in which it was employed for the reduction of severe contraction of the knee, just at the crucial moment of the operation the patient awoke to a realization of the most exquisite pain.

**The Surgeon and the Anesthetist.**—In his paper Dr. Goldan had placed the anesthetist on the same level with the surgeon, but he thought this was not altogether a correct position. The importance of having a specialist to administer the anesthetic, it seemed to him, depended on the character of the operation. The fee also, he believed, should be in accordance with the character of the operation, rather than with the length of the patient's purse. The anesthetist should, of course, be properly compensated for his services, but he would hardly place these on the same level as the surgeon's.

**Nitrous Oxide Gas.**—Dr. H. W. Carter said he had tried ethyl chloride as a general anesthetic, but found it less satisfactory than nitrous oxide gas. The use of the latter as a preliminary to etherization constituted an almost ideal method. No one anesthetic was to be preferred in all cases, but the nitrous oxide and ether sequence had many advantages. As a rule, it was the safest and best form of anesthesia, and when it was employed, very much less ether was required than when ether was given by itself.

**Morphine Objectionable.**—The preliminary administration of morphine had the effect of prolonging the narcosis. It was also apt to greatly increase the tendency to vomiting. If the patient was in good condition, it was not advisable to give any stimulant before anesthesia, and in general he thought it the best plan to wait until stimulation was actually needed before resorting to it.

**Good Results from Spinal Cocainization in Children.**—Dr. J. T. Gwathmey said that in Dr. Bainbridge's first thirty cases of spinal cocainization among children at the Randall's Island Hospital none of the unpleasant effects from this method noted by other operations was observed either during or after the operation. In one of the patients headache was caused, which lasted for two days, but that was all.

**Nitrous Oxide and Ether.**—As a rule, however, ether or chloroform was undoubtedly preferable. Now that the practice of using nitrous oxide gas as a preliminary to etherization had come into comparatively general use, he thought that the mortality statistics of ether would have to be revised. This method was so agreeable to the patient and was attended with so many

other advantages that it seemed almost criminal not to employ it wherever it was admissible. One of the principal objections to ether was its deleterious action on the kidneys, but, in consequence of the much smaller amount of the drug required when nitrous oxide was used first, he believed that this would in great measure be obviated. It was a fact that where we formerly had to give ounces of ether, we now gave only drams.

**Nausea and Vomiting.**—The nausea and vomiting so often seen after ether were apparently largely due to the impression on the olfactories. As the patient was coming out of the anesthesia, therefore, he thought it advisable that he should be allowed to inhale some substance, such as Cologne water, which had a pleasant odor, but which should not be too sweet. In this way we could do away with the saturation of the mucous membranes by ether.

**Local Anesthesia.**—Dr. A. E. Gallant said that in the local use of cocaine the trouble was that the injection was usually made under the skin or into the cellular tissue, instead of simply under the epidermis. If properly employed, about the same anesthetic effect could be obtained by the simple injection of sterile water, as it had been shown that this effectually obtunded the sensitive nerves.

**Small Doses of Morphine Advantageous.**—As to general anesthesia, much depended on the way in which we prepared our patients. It was his practice to give $^1/_{32}$ or $^1/_8$ grain of morphine (according to the size of the patient) one hour before operation. This small amount had the effect of quieting the respiration and the heart, and rendered the patient comfortable and cheerful.

**Nitrous Oxide Gas.**—As long ago as 1892 he began to use nitrous oxide as a preliminary to ether, and some of his experiences with it had been by no means pleasant. Under the excitement caused by it a vigorous patient could certainly occasion a great deal of trouble. It seemed to him that the day would come when this agent would be regarded as not altogether as harmless as was now generally supposed.

**The Administration of Ether.**—Personally he did not believe in cumbersome forms of apparatus. Without them he could maintain anesthesia for as long a time as was required for any operation, and yet with comparatively little risk. In giving ether he was accustomed to use the Allis inhaler, by means of which the ether is very thoroughly mixed with air, so that the patient does not suffer from the suffocation usually felt at first inhaling and does not have to breathe the same air over and over again. Being warm, the vapor does not irritate the lungs. The nausea from ether is largely due to the fact that after the ether has been carried through the circulation, more or less of it is excreted into the stomach. Hence the patient should be well washed out when the anesthesia is completed. He should drink plenty of hot water, and a saline injection should be made into the bowel. The stomach tube may be used for washing out the stomach, if desired.

**The Position of the Anesthetist.**—As to the fees received by the anesthetist, it had been his rule to allow him 10 per cent. of the amount charged for the operation, and this seemed to him an equitable arrangement. He did not think the anesthetist was in the same position as the surgeon, of whom more was required. The anesthesia specialists were undoubtedly deserving of great credit. They were doing good missionary work, but if they insisted on advancing unwarranted claims they would find their occupation gone. The result would be that this branch would be properly taught in all our medical schools and that their graduates would consequently be competent to administer anesthetics in a satisfactory manner.

## BOOK REVIEWS.

Diseases of the Liver, Pancreas and Suprarenal Capsules. By Leopold Oser, M.D. of the University of Vienna; Edmund Neusser, M.D., of the University of Vienna; Heinrich Quincke, M.D., University of Kiel; G. Hoppe-Seyler, M.D., University of Kiel. Edited with additions by Reginald H. Fitz, M.D., Harvard University and Frederick A. Packard, M.D., Philadelphia. W. B. Saunders & Co., Philadelphia, New York, London.

The present volume of the American edition of Nothnagel's encyclopedia of practical medicine reflects great credit on the American editors as well as on the publishers. Almost needless to say, Dr. Fitz has distinctly added to the value of the sections on diseases of the pancreas and of the suprarenal capsule. He modestly states that it has been his privilege to avail himself of the writings of Körte and of Mayo Robson, but his own additions are even more distinctly of value than any cited from others. Other American work of very high order has been incorporated in this present edition. Opie's observations on degeneration of the Islands of Langerhans in connection with diabetes is the most important of these additions, though it scarcely surpasses in interest Flexner's observations of fat necrosis. This volume contains also an account of the therapeutics of the suprarenal capsule and the active principles of these glands as studied in the last few years by Von Fürth and Takamine.

The section on diseases of the liver was edited by the late Frederick Packard, of Philadelphia, and as he was well known as a thoroughly competent and faithfully conscientious student of diseases of the liver these chapters have been brought well up to date. Dr. Packard's work in this volume represents almost the last medical writing that he did and some of his acute editorial observations and additions must stand as one of the worthy monuments of a brilliant young medical man cut off untimely.

This whole volume leaves nothing to be desired in the way of completeness of information, orderly arrangement of the text, thoroughgoing up-to-dateness, handiness for reference and exhaustive discussion of the subjects treated. The book is a noteworthy addition to American medical literature and well deserves a place in the library of every progressive physician.

American Edition of Nothnagel's Practice.—Diseases of the Stomach. By Dr. F. Riegel, of Giessen. Edited, with additions, by Charles G. Stockton, M.D., Professor of Medicine in the University of Buffalo. W. B. Saunders & Company, Philadelphia, New York and London.

The present volume of the Nothnagel series keeps up the good work previously noted in this edition and makes it clear that between the American editors and the publishers this greatest of modern text-books of the whole subject of medicine is to have a worthy presentation to the English-speaking medical public. As in previous volumes, the work of the American editor constitutes a distinct addition of noteworthy value to the work of the original European writers.

The book-making in this volume is well up to the highest standard. The illustrations are well reproduced and add not a little to the value of the text. The illustrations of the various malpositions of the stomach, as seen by shadows on the abdominal wall after dilatation of the stomach by gas inflation, are especially helpful in the understanding of the symptoms and course of the conditions and of the indications for treatment.

All the methods of gastric diagnoses are thoroughly

exploited and a number of the editorial notes in this part of the work serve to bring the book down to the very latest date in medicine. The American editor has also introduced valuable hints from recent advances in therapeutics. The employment of adrenalin chloride for instance, in hemorrhage from the stomach, which was unknown to the European writers at the time of the issue of the German edition, finds its due place here. In the discussion of other drugs, notably bismuth, morphine and atropine, the editorial notes are of special value and contain many excerpts from recent literature.

There is perhaps a suggestion that would make these books more handy. With the present rather thick paper the volumes are bulky and liable to deteriorate easily from use; yet it would seem that they should be available for frequent reference for many years.

The Buckeye Doctor. By William N. Pennell, M.D. The Grafton Press, New York.

The physician in fiction is growing very popular, especially the true and noble, unhonored man, who gives his life to the simple countryfolk, and wins a bare living and their gratitude in return. Since the days of Ian MacLaren's "Country Doctor," this type of old-fashioned physicians is being worked into every story.

It is, therefore, something of a relief, as well as something of literary value, to find a humorous series of pen-sketches describing the crude and ignorant physicians of our own country a few decades ago.

"The Buckeye Doctor" deals with a situation and an environment much like that made famous by Edward Eggleston in his "Hoosier Schoolmaster."

A young, ambitious man, fairly well educated, and decent in his behavior, tries, as did many such some thirty years ago, to let his light shine in the midst of medical darkness, and barely escapes having it extinguished altogether.

Dr. Pennell does not tell us that the pages are autobiographic, but as they originated in a series of letters to his daughter while at college, we may feel sure that the conditions he describes, and the local coloring, as well as the vernacular give us a faithful representation of scenes that were once familiar. Though happily they are now in the past, there is nevertheless a distinct literary reason for preserving them. The thread of the story becomes woven into a very good and exciting plot, and innocence triumphs and the villain gets his deserts. But the chief interest to the physician is in the details that must have been jotted down from an observant memory of conditions that will become rarer each year.

Ambulance Work and Nursing. A Handbook on First Aid to the Injured, with a Section on Nursing. Profusely Illustrated. W. T. Keener & Co., Chicago.

This work, which is anonymous, is evidently written by one of large practical experience. We are told in the Preface that it was written by a specialist whose connection with ambulance work in this country entitles him to speak with authority upon the subject and the views set forth are the result of personal experience in the rendering of First Aid, coupled with a long acquaintance with the system of teaching employed by the leading ambulance associations of the world.

The value of prompt and intelligent assistance in many cases of accident or injury cannot be overestimated, as the comfort or even the safety of the sufferer may thus often be assured, pending the arrival of the surgeon or the removal of the patient to the hospital.

The industrial conditions of modern life, the introduction of vast intricate and often dangerous machinery in almost every field of labor has served to materially magnify the risks to life and limb, which are inseparable from many occupations. The number of accidents constantly occurring from diverse and almost innumerable causes emphasizes the importance of prompt and immediate aid to the injured.

It is the object of this work to diffuse among the masses some knowledge of their own bodies and to teach them how to act in rendering effective aid in such emergencies until the arrival of skilled medical assistance.

As the work is designed chiefly to meet the wants of the laity, the terms employed are as simple and non-technical as possible, and the general directions as to the management of the case, what is necessary to be done, and how to do it, are plain, clear and readily comprehensible.

An outline of the anatomy and physiology of the human body is given, followed by directions as to the management of cases of hemorrhage, wounds, fractures, dislocations and other injuries, burns, scalds, poisonings, the removal of foreign bodies from the eyes, ears, and nose, etc., with a chapter on the carrying of the injured to the hospital and stretcher exercises.

The second part is devoted to nurses and nursing, massage and allied forms of treatment, concluding with a chapter on bone setting and bone setters.

The photographic illustrations are original, and for the most part, are of especial excellence. The proper methods of bandaging, the application of different forms of bandage, the use of splints, etc., are photographed from the living subject and convey more clearly what is sought to be conveyed than any amount of descriptive text. The general make-up of the book is handsome and attractive, the typography is excellent, the binding durable and the size convenient.

How to Keep Well. An Explanation of Modern Methods of Preventing Disease. By Floyd M. Crandall, M.D. Doubleday, Page & Company, New York.

There has been no class of literature so much abused by the quack and so little cultivated by the educated man as popular medical writing.

In it the charlatan has found a rich mine and the various popular health journals that are springing up over the entire country are evidence of a great need heretofore pandered to by truculent and money grubbing shysters. Even the popular works on medicine have for the most part been beneath contempt.

It is a healthy sign then of enlightened publishing spirit to find a readable and scientific work on popular medicine written by an author of acknowledged standing and of high literary and scientific attainments.

Dr. Crandall has written a very excellent popular work on medicine. One that can with profit and propriety be recommended by the profession to the laity. He discusses the general causes of disease, and then takes up some of the modern modes of treatment by vaccines, antitoxins, etc. Modern surroundings and their relationship to disease is well written and such miscellaneous topics as Rearing of Children, Diet for Children, Heredity, Regimen for Adult Life, Dangers Common to Middle Life, The Sedentary Life, Age and its Advancement, are all full of good counsel and interest.

We recommend this work unhesitatingly to our readers and wish for it a wide and hearty reception by the public, medical as well as lay.

# THE MEDICAL NEWS.

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## ORIGINAL ARTICLES.

### A REVIEW OF SOME OF THE RECENT LITERATURE OF THE ETIOLOGY, PATHOLOGY AND PROPHYLAXIS OF HYDROPHOBIA.*

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SOME years ago I heard a professor in one of our American medical schools say, in referring to Pasteur, that he was indeed a poor man who could not find a successful treatment for a disease which he had himself created. This skepticism in regard to the existence of hydrophobia in man, strange as it may seem, is still entertained by a few in high places. I cannot answer these men better than by saying that their contention shows complete ignorance of the literature of the subject.

The disease was first described by Aristotle, again by Celsus; in 1767 by Mead; in 1771 Van Swieten distinguished the violent and paralytic forms; Morgagni also describes it, also Gohier in 1811; Grüner in 1813 found the saliva to be the vehicle of infection; again Berndt described it in 1822; Galtier in 1871 produced the disease in rabbits; in 1880 Nocard and Paul Bert began to investigate it in the laboratory. They proved that the poisonous part of the virus would not pass through a filter of porcelain. This brings us to Pasteur and his pupils.[1]

Hydrophobia is an acute infectious disease due to the inoculation of a specific virus, usually by the bite of a rabid animal. "In nine-tenths of the cases the disease is contracted from a dog, in a few cases from cats, very seldom from a fox or wolf."[2] Dogs and cats have the disease more frequently than wolves. Horses seldom have it, cattle are affected rather frequently, while pigs rarely contract it. This is probably due to the large amount of subcutaneous fat in the latter.[4] Epidemics have several times been reported among deer, and skunks suffer from the disease. Rabies can be inoculated in pretty much all warm-blooded animals and in birds. In Great Britain and Ireland the disease is practically confined to carnivora. Hydrophobia is said to have been produced by the bite of an animal not suffering from rabies. This is opposed to all we know of the origin of other diseases.[2] The dog may have had the dumb form of the disease or else had it in a very mild form. The saliva may be inoculated in a wound or on a mucous surface. Senn[3] recounts a case of his in which the saliva of a rabid dog was inoculated in a pimple on the face of a lady of rank and fashion who succumbed to the disease.

It has been produced by wounds occurring during the dissection of rabid animals. It has also been caused by eating the flesh of animals that had died of the disease. The milk of suckling animals and suckling human beings contains the virus. Bradford tells of a child in the West Indies that contracted the disease from its mother who was suffering from rabies.

The virus is found in the central nervous system, the peripheral nerves, the salivary glands, the pancreas, the lacrymal gland, the suprarenal glands, the mammary gland and perhaps in the seminal fluid. It is not found in the blood, the liver, the spleen or the kidney or urine. In air the virus loses its virulence in fourteen hours, in water in twenty to forty days, in glycerin in one month. It has been found in a dog buried for forty-four days and in a rabbit buried for twenty-one days. Such cases are exceptional.[1]

1. *Age and Sex.*—More males than females are affected, the proportion being about four to one. This is due to the risk of exposure and difference in dress. Two-fifths of all cases are under fifteen years of age.[2]

2. *Location of Bite.*—Bites upon the face and hands are far more liable to produce the disease than others both on account of these parts being uncovered by clothing and on account of the greater likelihood of the involvement of nerves.

3. *Statistics of Frequency after Bites by Rabid Animals.*—G. S. Woodhead[4] states that 16 per cent. of those bitten by rabid animals contract the disease. Bradford[1] estimates that from 10 to 20 per cent. contract it. Many authorities estimate the percentage to be much greater.

4. *Prevalence.*—The disease is fairly prevalent among animals in certain localities while it is entirely absent from others. Among the former may be mentioned especially Lancashire in England, also Ireland and certain parts of France and Germany, while it is not found in Australia and Norway. It has been introduced by sporting dogs into countries where it was formerly unknown.[1]

5. *Period of Incubation.*—The period of incubation varies in man, according to Bradford, from a minimum of twenty days to sixty days, while it is probably unknown after six months.[1] Other authors have given twelve months, two and even five years as extreme limits. Gowers[2] considers it certain that the disease has developed after a year or eighteen months and will not deny the possibility of a longer interval. This period seems to vary according to the susceptibility of the patient, the virulence of the disease in the animal inflicting the bite, the amount of virus introduced and the position of the bite.[4]

6. That the disease is due to a living organism which affects the nervous system chiefly is almost beyond doubt. The long period of incubation

* Read before the West End Medical Society, April 4, 1903.

would tend to prove that the infective agent has to multiply in the tissues before it can produce its effects. Whether this agent be animal or vegetable has not been determined. It is scarcely necessary here to describe the many organisms that Gibier, Pasteur, Roux, Fol, Babés, A. Bruschettini and others have from time to time considered to be the cause of the disease. That it is not due to a previously formed poison we can be comparatively certain when we consider the difference in the action of the saliva of a rabid animal and the venom of a snake. Again the similarity of this disease to tetanus would suggest a similar causation.

*Pathological Anatomy.*—The blood is usually fluid, there is marked congestion of the fauces, pharynx, larynx and stomach. The stomach of the dog usually contains all kinds of substances, such as wool, hair, coal, wood, etc. Minute hemorrhages may occur beneath the pleura, probably being due to the asphyxia which usually precedes death. Some perivascular exudation of leucocytes may be found in the salivary glands and kidney. The brain, medulla and spinal cord often present marked congestion and very minute hemorrhages may be found. Microscopical examination of the cerebrospinal system will often reveal exudation of leucocytes into the perivascular spaces in different localities, minute thrombi, hyaline changes in and around the blood vessels, exudation of leucocytes around nerve cells, together with more or less marked changes in the latter, consisting in swelling of the cells, chromatolysis with the appearance of hyaline bodies and vacuoles.

These changes in the nervous system are most marked in the medulla, especially in the neighborhood of the pneumogastric and hypoglossal nuclei; they are next most marked in the cord, and least in the brain itself. Most authorities agree in considering these lesions as not characteristic. They are said to occur in other diseases and in certain cases of poisoning by phosphorus and arsenic. Babés[5] insists most strongly upon the importance of these perivascular and pericellular nodules and considers them of more importance than the gangliar lesions of Van Gehuchten which I shall presently describe. Subsequent investigations by several authorities do not seem to sustain him absolutely in the contention, and most investigators regard the following observations as having the most important practical relation to diagnosis.

In 1900 Nélis demonstrated before the Academy of Medicine of Paris certain changes in the peripheral ganglia of the cerebrospinal and sympathetic nervous systems that have the most direct bearing upon the nature of rabies.[6] If a spinal ganglion of a normal dog be examined it will be found to be composed of a peripheral zone made up for the most part of nerve cells and of a central part which is traversed by bundles of nerve fibers which join either the posterior root or a peripheral nerve. Between these central fibers there are some islands of nerve cells. Each one of these nerve cells is enclosed in a capsule. This capsule is composed of two layers, an external fibrous layer, and an internal layer consisting of a single row of endothelial cells. If a spinal ganglion of a dog that has died of rabies be examined, it will be found that a number of these nerve cells have more or less completely disappeared, while their place is taken by numerous small cells regularly arranged and having their origin in a proliferation of the endothelial cells lining the capsule.

By examining different sections, progressive degenerative changes in the nerve cells may be noted. These consist chiefly in chromatolysis, or solution of chromatophile substance, which is more or less complete. Nuclear changes vary likewise from cell to cell. The most frequent changes are hypertrophy of the nucleolus, hyperchromatosis and fragmentation of the nucleus. These changes in the nerve cells may be met with in different degrees in all the cells of the cerebrospinal axis and are not characteristic of rabies. The proliferation of the endothelial cells of the cell capsule, however, is regarded by Van Gehuchten and Nélis[7] as being pathognomonic of this affection. Besides the changes in the cell and its capsule there are present also dilatation of the blood vessels and perivascular exudations of leucocytes. These lesions are most marked in the plexiform ganglion of the pneumogastric. They are often absent when a dog is killed before the paralytic stage. They are often absent in experimental rabies when virus from the medulla of a mad dog is injected subdurally, and are usually absent when fixed virus is administered in the same manner. Nocard considers this method as most valuable on account of its simplicity and the rapidity of its application. These lesions have been fully verified by Cuillé and Vaillée, McCarthy and Ravenel and many others. The animal should be allowed to die or not be killed until the paralytic stage of the affection.

When a person has been bitten, it is the duty of the physician to look up the dog. If it happens to be a stray dog, of which all trace has been lost, Van Gehuchten[8] advises that the Pasteur treatment be at once resorted to. If the bite has been made by a known dog that does not as yet present symptoms of rabies, he should be confined for a few days. The saliva is virulent only twenty-four to forty-eight hours before the appearance of symptoms (Nocard, Roux). Generally these lesions will exist after the dog has become dangerous. The dog will usually live only two to five days, when a pathological examination will be most likely to give definite information. Of 44 cases examined by Degive, 37 had rabies and showed the changes, 7 did not have rabies and did not show them. J. Crocq and others have called attention to the similarity of the changes in the pneumogastric and other ganglia occurring in other diseases, especially diphtheritic croup. In diphtheria, however, the lesions are only capsular while in rabies they are both vascular and capsular. He calls attention to the similarity of

conditions in the pneumogastric in the asphyxia of the two diseases.[9] Nocard said, after verifying the work of Cuillé and Vaillée, that he knew of no disease up to that time in which precisely similar lesions had been found.

In a recent paper, D. J. McCarthy and M. P. Ravenel[10] of the Wm. Pepper Clinical Laboratory (Phœbe A. Hearst Foundation) report concerning 105 animals suspected to be rabid; of these 75 were dogs, 11 cows, 2 horses, 2 cats, 15 rabbits (experimental); one of the cows was also experimental. Forty of these cases were controlled by inoculation into rabbits, while many of the dogs were kept at the Veterinary College of the University of Pa. for many days. In 60 of these cases both the medulla and intervertebral ganglia were examined; in 36 only the ganglia, and in 7 only the medulla. In only 2 cases did they fail to find the lesion of Babés in the medulla when the changes in the ganglia were marked, but in several the bulbar lesion was slight. The vascular tubercle of Babés was much more frequently found than the one having the nerve cells as a starting point. Of 22 dogs *killed*, in 7 the authors would give no opinion. In 87 of 105 cases they were able to give a prompt diagnosis by examination of the ganglia alone, and in 94 by an examination of the ganglia and medulla.

The great advantage of this test is evident when it is considered that it may be done in tweny-four hours by hardening in alcohol, or in one hour if frozen sections be made, while experimental inoculation in rabbits takes from twelve to fourteen days usually, and may take forty days or more.[1] To neglect no precaution, the clinical history of the dog should be carefully considered, his spinal ganglia and medulla should be examined and inoculation into rabbits be made.

GENERAL PROPHYLAXIS.

1. Stray dogs should be destroyed as they generally cannot be located and watched after the bite has been inflicted.

2. Literature should be disseminated among the police and people concerning the necessity of trying to capture instead of killing dogs that have bitten any one, or that are supposed to be rabid.

3. *Muzzling of Dogs.*—On account of the muzzling of dogs hydrophobia has rarely occurred in Germany. The deaths for 1894-'98 were only 4 or 5 in animals.[12]

"In the metropolitan district of London, in which the muzzling order is now in force, there were in 1889, 176 cases; in 1890, the number had fallen to 44; in 1891 to 28, and in 1892 to 3. This fall corresponded to and was continuous with the enforcing of the muzzling order. As soon as the order was allowed to lapse, a rise in the number of cases began and continued until the order was re-enforced. During the five years mentioned no fewer than 25 persons died of hydrophobia, and 147 cases were sent for treatment to the Pasteur institute."[4]

4. *Treatment of the Wounds.*—As the poison is but slowly diffused there is a fair chance of getting rid of it entirely if proper measures be at once resorted to. A ligature should be placed about the limb and cupping or suction be resorted to and a physician be called. Some recommend immediate excision of the tissues in the neighborhood of the wound. Should this be inexpedient it should at once be cauterized. Dr. Cabot, of our Board of Health, has detailed a series of experiments in regard to the value of various cauterizing substances. He finds that 91 per cent. of guinea pigs inoculated with medulla of rabid guinea pigs do not develop the disease if their wounds be cauterized with fuming nitric acid at the end of 24 hours. Nitric acid is better than the actual cautery, and this in turn is better than nitrate of silver. In the case of small wounds he considers cauterization with nitric acid to be all that is necessary.

5. *Prophylactic Inoculations.*—About a score of years ago Pasteur discovered that the virus derived from the spinal cord of a rabid dog was attenuated by keeping. He also found that rabic virus could be attenuated by passing it through a series of monkeys until it became powerless to produce death. By passing this attenuated virus through a series of rabbits its virulence could be entirely restored. He also found that by passing the virus of a rabid dog through a series of rabbits (100) its virulence could be augmented, so that the ordinary incubation period of from fourteen to twenty days could be reduced to seven or even six days. This was the strongest virus obtainable which he termed *"virus fixe."* He first succeeded in a measure in producing immunity in dogs by the use of virus attenuated by passage through various animals. This system was difficult, uncertain and only partially successful. Later, assisted by Roux and Chamberland, he cut a series of cords of rabbits dead of injections of *"virus fixe"* into short sections, which he exposed to the action of dry filtered air at 72° F. for different lengths of time. He found that the cord removed after twenty-four hours was but slightly reduced in virulence, that removed after forty-eight hours was somewhat more reduced in virulence, and that the virulence gradually diminished until at the end of two weeks the virus was incapable of producing rabies. Now he injected an emulsion of the fourteen-day cord into a dog that had been bitten by a dog known to be suffering from rabies; this was followed by an injection of the thirteen-day cord and so on until the unattenuated cord was injected. By following up this system he proved that not only could a dog be protected against the bite of a rabid dog inflicted some days beforehand but that he could be protected against the fixed virus administered subdurally.

In 1885 this system was applied in the case of Joseph Meister who had been bitten by a mad dog. He was alive and well after five years. There are now used at the Pasteur Institute two methods known as the "simple" and the "intensive." In both methods cords are employed in increasing strengths until the three-day cord is finally

administered subcutaneously. In the simple method 19 injections are given in fourteen days. The intensive method is used for specially severe lacerated bites on the face and in the vicinity of large nerve trunks, and in the case of bites by wolves. This method consists in the administration of 28 injections in twenty-one days. Here the number of injections which, in the simple treatment, are spread over five days, are made in three days; then, on the fourteenth day, a fresh series of injections or rather repetitions, is begun which lasts until the twenty-first day.[4] The Board of Health of this city now makes prophylactic injections as well as pathological examinations, and inoculations for purposes of diagnosis.

Time prevents me from giving but a few statistics. I shall give only a summary of the cases treated at the Pasteur Institute, Paris, from 1886 to 1895 inclusive. If the cases be excluded in which the disease declared itself within a fortnight after completion of the treatment, there are 17,337 cases with 83 deaths, a mortality of 0.48 per cent. If all the cases be counted in which treatment was completed, we find 17,385 cases with 129 deaths or 0.74 per cent. Ten cases died during treatment, so that in all there are 17,395 cases with 139 deaths. Now Bradford's[1] conservative estimate gives the mortality of those bitten by dogs adjudged to be rabid at from 10 to 20 per cent. If we make even more than due allowance and place the mortality at 5 per cent., we find that among the above-mentioned cases we should have had 869 deaths, more than six times as many as we actually find after the Pasteur treatment.

Granted that a few have perished from the treatment, its inestimable value is beyond question. Many eminent authorities, however, agree that the treatment is absolutely harmless. It received the endorsement of a commission, of which Victor Horsley was chairman, appointed by the British House of Lords to inquire into Pasteur's methods.[14]

*Serum Therapy.*—We come now to an aspect of our subject which promises much. The difficulty of finding an antirabic serum can be appreciated when we consider that the germ of the disease has not been isolated, so that we do not know whether we have to find an antitoxin, a bacteriolysin, a precipitin or a combination of these substances. The first work along this line was done by Babés and Lepp in 1889, later by Tizzoni and Schwarz and then by Tizzoni and Centanni. In 1895, after six years of study and experiment, Tizzoni and Centanni published their work. In their experiments they used virus attenuated by digestion with gastric juice, which method being introduced by Eusebius Valli in 1886, is known as the Italian method. The latter found that digestion of virus by this method, while diminishing its virulence, in no way impairs its protective power. By making 17 injections in twenty days into a sheep (.25 gm. per kilo., of emulsion of nerve substance weakened by gastric juice) they found that after twenty-five days they had a protective serum of great potency. For revaccinations of the sheep they employed 10 injections in twelve days.

This serum cannot be increased in power beyond the point at which they arrived, but it can be maintained at a constant strength by repeating the inoculations from every two to five months. Moreover, it can be evaporated to dryness and will keep for months if protected from light.

Their typical serum (T. S.) is such that in proportion of 1-25,000 per kilogram weight of rabbit it will protect it against one infection unit of virus if administered subcutaneously twenty-four hours before the subdural injection of the virus is given.

An infection unit is the greatest dilution of any virus that will surely kill without any prolongation of the incubation period when .013 c.cm. per kilo. of animal is administered beneath the dura. The dose of virus actually used by them was .013 c.cm. per kilogram of canine virus diluted 1-50 which equaled .00026 c.cm. pure canine virus. They employed also two specimens of fixed virus, the first in a dilution of 1-5,000, and the second in a dilution of 1-10,000. Of the former the actual dose (.013 c.cm of dilution per kilo.) was 0.0000026 c.cm., and of the latter .0000013 c.cm. fixed virus.

One c.cm. of their serum (T. S.) neutralizes *in vitro* 1,200 infection units. On the eighth day 10 c.cm. of this serum protected rabbits weighing about 2 kilograms from a dose of canine virus twice as concentrated as was usually used for subdural injections, introduced into the sheath of the sciatic nerve.

On the first day after infection a dose of serum as much as five times greater than the protective dose is required, not to save the animal but only to postpone its death. On the eighth day the protective dose is to the curative as 1-10. The preventive against the virus of rabies is to the preventive against the fixed virus as 1-200. When the period of injection is postponed to the fifth to eighth day, Tizzoni and Centanni find that the curative dose has only to be multiplied some 8 or 10 times, whereas in diphtheria it must be increased at least 20 to 100 times, and in tetanus several thousand times. As in the case of tetanus, these authors found the subdural injection of the serum far more efficacious than the subcutaneous method. The subcutaneous dose of serum is 12,000 times as great as that by direct contact.

The great advantages of a serum become at once manifest, as one small dose is effective immediately, no special skill is required, and the dried serum can be transported to a distance. How long will the immunity last? The authors state that inasmuch as a sufficient dose always prevents the disease, it does not matter much how long immunity lasts. This method has not been applied to human beings so far as I have been able to ascertain, but it is certainly encouraging from a scientific aspect.

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## HYDROPHOBIA: SYMPTOMS AND DIAGNOSIS.*

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The death within the past few months of the son of one of New York's most prominent physicians from what appears to have been unquestionably hydrophobia has attracted the attention of the profession and public with renewed interest to this most dreadful disease. Investigation resulting from this interest has developed the facts, according to official statements from the Board of Health, that the disease in both dogs and men, and also in horses, has shown a material increase during the past two years. It seems, therefore, appropriate as a subject for prompt and general discussion by the profession, and this Society is to be congratulated upon the alert wisdom of its President, Dr. Myers, who suggested it as the topic for this meeting.

My chief regret is that he was apparently unable to select any one better equipped in personal experience to present the subject to you. Such a dearth of personal experience and opportunity is both an advantage and a disadvantage. We are spared on the one hand the infinite distress attendant upon witnessing the agonized sufferings of such hopeless cases: on the other hand, we are robbed of the opportunities and inspirations which result from extended experiences and observations in the helpful study of disease. Possibly if hydrophobia were more frequent, it would be proportionately less terrible.

The disease is almost as old as medicine; it was certainly recognized and mentioned as occurring in dogs in the earliest records of medicine. Among the Greeks it was known as lyssa or lyssophobia. The worm (frenum) under the dog's tongue was supposed to be causatively related to the disease in some way. The term lyssophobia still occurs, especially among the Germans, its application to-day being largely restricted, however, to pseudo or false hydrophobia, the hysterical prototype or equivalent of the true disease. Is there a true disease? Are not all cases of so-called hydrophobia essentially hysterical? That people die with this symptom complex is not a final argument; that the influence of the mind upon the body is at times sufficient alone to arrest bodily function and cause death is abundantly proven by numerous experiments and facts observed in varied spheres of investigation. It is a curious fact in connection with the general subject that this has been a moot point, a vexed question since our very first knowledge of the disease. The pendulum swings from time to time from the extreme of unquestioning faith and acceptance to blind and extreme and dogmatic skepticism. In recent years the school of doubt has been most ably represented by no less a dean than Spitzka, whose experiments and observations seem to have convinced him at least that no such thing as hydrophobia exists, except as the product of a diseased and overwrought imagination. High in esteem as I hold any view or opinion entertained by so eminent an authority, I am compelled, in the light of what seems to me overwhelming and incontrovertible evidence, to accept hydrophobia as an actually existent medical entity and a frightful one at that. That the disease seems peculiarly and in extraordinary degree to be associated with an atmosphere of hysterical simulation and to inspire states of autosuggestion, must be admitted. One case of genuine hydrophobia in a community, especially if graphically described in the public press, will inspire fifty or a hundred examples of the pseudo type, and some of these latter may even prove fatal.

Infectiousness by example, so to speak, in nervous disease, is well known and admitted, as in chorea, hysteria, the various tics, etc. There seems to be a special and peculiar infection of morale in the atmosphere of this disease, possibly, and, indeed, probably explained by the horrible significance of symptomatic detail, and the utter hopelessness of the situation, both factors intensifying this mental impression.

Admitting the existence of hydrophobia as a disease entity, what are the symptoms by which it is to be recognized, and by what means are we to differentiate the true disease from the false and from other kindred affections? My confrère, Dr. Taylor, will pardon me if I necessarily encroach at this point somewhat upon his territory. I shall be as conservative as possible in my invasion. It is accepted as essential that the victim shall be infected extraneously—the dog, the cat, the wolf, skunk, and sometimes other animals, by biting introduce the virus of the disease. Within six weeks or six months, the wound having meantime healed apparently, in a normal way, the victim notices a lassitude, a malaise, and perhaps some slight feverishness with depression of spirits

* Read before the West End Medical Society, New York, May, 1903.

and nervous irritability, and simultaneously, as a rule, some recrudescence of irritation appears at the site of the original bite, slight redness with pain, and some stiffness or paresthesia is noted. This extends sometimes along the centripetal direction of nerve or blood vessel, or both, and at times the lymphatics are involved, and there is at this stage, termed the first great mental anxiety, a state of anxious apprehension and restless foreboding present, even in those who have forgotten a previous dog bite. Hydrophobia has been reported in idiots, and in the deaf and dumb. The temperature usually does not exceed 101 or 102° F., and may rarely be normal; the pulse is somewhat though not markedly accelerated, the face is alternately flushed and pallid, apparently as a reflex to the emotional equation. This, the stage of irritation, continues for two or three days, sometimes less, and ends abruptly in what is termed the convulsive stage. This second stage is introduced, as a rule, by symptoms indicating spasmodic difficulty in deglutition; stiffness of the neck muscles is complained of. On account of fever and hurried respiration, there is usually marked thirst and a consequent desire for water. Attempts to swallow the water are found to induce a spasm of the glottis and of the pharyngeal and neck muscles, the water being rejected by mouth or regurgitated through the nose. Repeated attempts produce the same result, so that finally the sight of water or the sound of running water will induce most distressing spasm of all the musculation of deglutition. Even the word "water" spoken in the hearing of such patients, or the washing of the face, may, by association provoke a spasm. The thirst increases, the patient tries again—again the result is the same. Can you imagine a more agonizing situation? Solids or semisolids can sometimes be swallowed, but by no means always. Sometimes the spasms become general—indeed, this is often the case—not only is the general spasm excited by efforts to swallow or by the sight or sound of water, but it may be excited by any source of reflex stimulation—a loud sound, a gust of wind, a touch upon the body anywhere may prove a sufficient exciting cause for generalized convulsions. Delirium may and often does ensue in the intervals. It is, however, sometimes absent throughout. Active hallucinations of any or all the senses, particularly of vision, may occur, and a state of exaggerated, almost frenzied terror may develop. The mental state is occasionally typical of acute delirium grave. After one, two or three days' duration this, the second or convulsive stage, gradually or abruptly passes into the third or paralytic stage. The pulse becomes weak, respiration hurried, general paralytic weakness supervenes and the patient quickly becomes stuporous and finally moribund, with evidences of pontine invasion and of pneumogastric failure. This stage rarely exceeds twenty-four hours in duration.

In many cases of rabies, as the disease is termed when it occurs in dogs, the first and second stages as described above do not occur, the dog passing at once into the paralytic stage. This variety is known as dumb rabies, and is said to occur occasionally, though rarely, in human subjects. Among symptoms specially noted by different observers, Watson particularly emphasizes a peculiar sobbing or shuddering respiration, such as is made by a person entering cold water. McCarthy and Ravenel call attention to an expression of terror not due to suggestion, as in both cases cited the patient was a young child.

The all-important problem in differential diagnosis is the distinction between true and false hydrophobia. It should never be forgotten that death has occurred from the false disease. In such cases the moral attitude of the attending physician, stimulated to firmness by conviction, may decide the issue as between life and death. The following points are more or less constant in the differential diagnosis. In pseudo or hysterical hydrophobia, the incubative period is either much shorter or much longer than in the true disease—symptoms developing earlier than a week or ten days, or even three or four weeks after a bite are suspicious, just as delay beyond five or six months is suspicious of the pseudo disease. It should not be forgotten however, that the true disease has developed within five days from the bite, and that it has been delayed for as much as twelve months. Symptoms developing within a day or two after a bite are almost certainly hysterical. The order of sequence in the hysterical disease is characteristic sometimes. There is no first and no second stage. The patient develops at once the second or convulsive stage. Hysterical hydrophobics nearly always show a disposition to bite those about them—very rare in the genuine disease; they also bark and growl and snap with much more imitative accuracy than in the genuine disease. To show them the dog that bit them, alive and well, is often a final test, the result being immediate recovery. Should the symptoms in any case last over seven days or ten days at most, this fact alone is almost conclusive as to the non-existence of the genuine disease. The crucial test, of course, is that of Pasteur inoculation.

From tetanus, often closely resembling hydrophobia, the latter disease is to be distinguished by the greater prominence of trismus; by the fact that the cause is a wound and not a bite; by the absence of mental symptoms; by the absence of remissions in the convulsions; by the absence of thirst, expression of terror, dribbling of saliva, and by the shorter period of incubation. In certain cases of acute mania, there may be gustatory hallucinations and fear of water. In such cases there are, however, no tonic or clonic convulsions, the patient may be induced diplomatically to drink, there is no history of the bite of a warm-blooded animal, and there are the other symptoms of mania.

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**Female Physicians in England.**—There are about 90 female physicians in London and its suburbs. The Royal Free Hospital employs 16, and there are 70 women students in it. In all England there are about 600 women physicians.

## RABIES.*

BY H. D. GILL, V.S.,
OF NEW YORK.

From the time of Aristotle (322 B.C.) to the present day we have clear accounts of this disease existing through every age, and provoking fear and horror in many countries. It was caused by the bite of an animal and such animal was generally believed to be mad.

The medical and veterinary profession have always recognized the existence of such a disease as rabies in man and animals and also believed in its existence and contagiousness. It was not until the nineteenth century that by experimental inoculation it was shown that the dog which did the biting was actually rabid, and that the disease certainly resulted from the bite, and that the disease in the dog and man were identical. Notwithstanding the fact that it had been very clearly demonstrated by competent investigators that rabies may be easily communicated by inoculation from animal to animal and man to animal, there are many who still believe that hydrophobia is not a specific disease and is about as likely to follow the bite of a healthy dog as of a diseased one.

If the skeptics would only stop to consider that an animal cannot communicate a contagion it does not possess, the absurdity of spontaneous origin would be apparent. One might as well say that smallpox arises spontaneously and that the disease can be contracted from healthy persons.

Hydrophobia has been observed in the following species: dog, cat, horse, ox, donkey, mule, sheep, goat, hen, pigeon, wolf, fox, prairie dog, hyena, monkey, deer, skunk, rabbit, guinea pig, rat and mouse.

*Prevalence of Rabies.*—For years we have been led to believe that this disease was extremely rare. In 1900 Dr. D. E. Salmon, chief of the U. S. Bureau of Animal Industry, to determine the occurrence of rabies in the United States, wrote to a number of veterinarians and was surprised to learn that the disease existed in nearly every State and was evidently on the increase. City veterinarians who doctor dogs see many cases of rabies. During the year of 1902, 20 cases came under my observation, and four since last December. On two occasions I noticed small boys leading rabid dogs through the street. I believe if an accurate record of rabid dogs in the Borough of Manhattan could be had, the result would be startling.

In dogs hydrophobia appears in two forms, furious rabies and dumb or mute rabies. According to Pasteur, furious rabies occur when the brain is invaded by the rabid virus and dumb rabies when this reaches the spinal cord first. I have noticed that in many cases when an animal was bitten by a rabid dog on the head or face it produced the furious, and if bitten on the body or legs the dumb form developed. Three cases came under my observation during the month of January; two dogs and a horse all were bitten on the nose by the same dog and were subsequently affected with the furious form of rabies.

The furious form of rabies presents three periods: (1) melancholic period; (2) irritated period; (3) paralytic or terminal period. The duration of the first period varies from twelve hours to two days. During this time we notice a change in the patient's habits; he is depressed, gloomy, or anxious, defiant, restless, cross, and very irritable. He no longer obeys his master. He hides away, changes position suddenly. Some animals are exceedingly gentle and affectionate. In the beginning appetite is good but they soon refuse to eat. They lick cold objects or bite everything within reach and swallow foreign bodies, such as straw, coal, wood, feathers, pebbles, rugs, etc. We sometimes notice nausea and vomiting.

The second period, that of irritation, lasts three or four days and is characterized by spasmodic mad attacks, the restlessness increases and an irresistible force induces the patients to run away, covering great distances in a short time. They have a great inclination to bite and show no sign of fear; and rarely avoid people or animals, and when caged chew continuously on the bars, breaking their teeth or fracturing their jaws. At this change the bark is changed to a peculiar howl.

The third, or paralytic period, the animal presents a sullen and scowling expression, the lower jaw is paralyzed and hangs pendulous. The gait is staggering and he dies from cerebral paralysis or exhaustion from the fifth to the eighth day.

Dumb rabies is distinguished from furious rabies by the absence of the second period of irritation. The most characteristic symptom of dumb rabies is the dropped lower jaw, animal being unable to close the mouth, the tongue is hanging out, and there is dribbling of saliva. The membrane of the mouth is dry, discolored, and covered with dirt or dust. The lower jaw being paralyzed, the dog cannot bite, nor does it desire to; while in the third stage of the furious form when the jaw is also paralyzed, the desire and tendency to bite may be retained. The course of this form of rabies is short: death usually occurring in from two to four days.

The dumb form of rabies is very common and many cases are brought to the veterinary hospitals with the owners' suggestion that the dog has a bone in his throat, and in many instances we are unable to convince the owner of our diagnosis, who generally understands that a mad dog must froth from the mouth, be afraid of water, and raging mad. It is a dangerous error to suppose that the disease commences with such signs. Rabid dogs are not afraid of water, to the contrary, they lap and plunge their heads into it, some will even swim rivers. The symptoms appear very gradually and the only change noticeable is in the animal's habits and behavior.

Beware of a dog when it becomes dull and hides away, appears restless, always on the move and prowling. Whose countenance is somber and sul-

* Paper read before the Alumni Association of the Bellevue Medical College.

len, walks with head down like a bear. Beware of one who barks at nothing when all around is still. Beware of a dog that scrapes incessantly and tears up things. Look out for the dog which has become too fond of you, and is continually trying to lick your hand and face. Beware, above all, of the dog who has difficulty in swallowing, which appears to have a bone in his throat, and one that has wandered from home and returns covered with dirt, exhausted and miserable.

How inconsistent with modern preventive medicine has been the handling of this terrible malady, the most feared and dreaded disease of mankind. Knowing as we do the reality of rabies in dogs and that hydrophobia in man is caused by bites, the first thing that ought to appeal to the medical mind is to get rid of the dangerous dog, and prevent the transmission of this terrible disease. It does not appear that any effort was ever made in this city in that direction. The whole aim seems to be to apply the Pasteur treatment. Numerous so-called "Pasteur Institutes" have sprung up and from their prosperous condition I should judge that a great many more persons are bitten by dogs than we are aware of.

Rabies is relatively more common in New York because dogs are very numerous, and if suitable regulations are not adopted and enforced the disease will surely increase, and the health of the people be unnecessarily jeopardized.

By a law enacted some years ago, the American Society for the Prevention of Cruelty to Animals was given power to license and gather in and destroy all homeless and ownerless dogs. This private corporation enjoys a yearly revenue of many thousands of dollars from such unconstitutional tax, and the only service it has rendered the people is to catch all unlicensed dogs that their men may happen to run across; throw them all together into a wagon or automobile where they fight and bite until the wagon reaches the pound, where I am told the same thing is practised.

By their methods this Society may be accessory to the spread of rabies, for example: One of these dogs may be rabid and bite one or more of the others that may be later on reclaimed and taken home. Suppose in a few weeks he develops rabies and goes on biting other dogs or perhaps some person. This has happened. This method also exposes reclaimed dogs to other contagious, infectious, and parasitic diseases.

This same society refused a certain bacteriologist the opportunity of making a diagnosis of a supposed case of rabies in a dog that had bitten one or more persons. I was not at all surprised at this, knowing that the president of this society believes that there is no such thing as rabies, except in the imagination and he some years ago issued an article on rabies and hydrophobia, which was scattered broadcast over the country, stating that it was unnecessary to enforce regulations against rabies in animals. I noticed only the other day, in a newspaper interview, that he still holds the same belief.

It is high time that this very serious dog question should be taken out of the hands of a private corporation, whose only care seems to be to collect license fees, and place it where it properly belongs, under the municipal control of the Health Department.

Dr. Salmon states that there is no contagious disease more easily eradicated than rabies. As the disease can only arise from contagion, and the contagion is practically always transferred by a dog's bite, it suffices to stop the dogs from biting for a period sufficient to cover the incubatory stage of the disease, that is, for about a year, in order to stamp out the malady. As a scientific problem, therefore, the eradication of rabies is a very simple matter, but as a practical question it is one of the most difficult which confronts the sanitarian.

And this difficulty arises not from anything inherent in the work to be accomplished but in the opposition of those who own and keep dogs. The measures necessary for the eradication of rabies are two in number: (1) Destruction of worthless, ownerless, and vagrant dogs: (2) efficient muzzling of all dogs which appear upon the streets or in public places. The results which have been obtained by muzzling justify its enforcement wherever there is an outbreak of rabies.

In Berlin from 1845 to 1853 there came to the Veterinary School a yearly average of 35 cases, from March, 1852 to 1853 there were 82 cases, and from March, 1853, to the end of July there were 37 more.

On July 20, muzzling was generally enforced with the result that but 6 cases were reported during the remainder of the year. Only 4 cases were observed in the whole city during 1854, and but a single case in 1855. For the seven years following there was not a single case recorded.

In 1863 muzzling was relaxed and rabies gradually increased until 1875 a law was passed extending to the whole of Prussia, which provides that all dogs suspected of rabies shall be immediately killed, as also all animals which it is evident have been bitten by rabid animals, and that all dogs in a district which has been infected by an outbreak of rabies shall be confined, or, when abroad, both muzzled and led. After the enforcement of the above law no case occurred for about ten years. Fleming states that in Vienna rabies was entirely suppressed by eighteen months of stringent muzzling, but in 1886 the muzzling order was rescinded and badges had to be worn on dog collars instead; in the following half year there was only one case of the disease, but in the next half year rabies became epidemic, and the muzzle had again to be worn, with the result that the malady soon subsided and disappeared. The value of the muzzle in suppressing rabies has been perhaps best demonstrated in London on several occasions, especially in 1885. In the previous years hydrophobia had increased to a very alarming extent in England, and no steps worthy of note had been taken to check the mortality. For London alone in that year no

fewer than 27 deaths were reported as due to the bites of rabid dogs. A muzzling order was then enforced, and at the end of 1886 not a death was recorded. Unfortunately, the order prescribing the use of the muzzle was then rescinded, and in a few months a case of hydrophobia occurred in the south of London, soon to be followed by others, and in 1889, 10 deaths were registered. In July of that year the muzzling order was again issued and stringently carried out, and rabies and hydrophobia once more disappeared.

For absolute public safety the following measures are suggested: (1) To place the city dog handling under proper medical or veterinary jurisdiction; (2) to prohibit all dogs from running at large unless muzzled or, at least, muzzle all dogs in infected areas; (3) to provide separate compartments in the wagon and at the pound for each dog; (4) to provide safe and proper places for the keeping of dogs suspected of having rabies, especially if they have bitten other dogs or a person; (5) every dog bitten by a rabid animal should be destroyed or quarantined for at least one year.

## BEST METHODS TO PREVENT HYDROPHOBIA.*

BY FOLLEN CABOT, M.D.,
OF NEW YORK.

Hydrophobia is rarely seen in man, but commonly seen in animals, more particularly in the dog.

The disease is one about which much ignorance exists in both the mind of the physician and the layman. On this account, we are greatly handicapped in our efforts to stamp out the disease. Few physicians ever see a case of hydrophobia, and as a consequence, many medical men even doubt its existence. Such a belief adds to the confusion and ocasionally does irreparable harm.

We have in hydrophobia a disease as well established in its etiology and symptomatology as is typhoid fever. Until we gain an intelligent understanding of the disease, particularly its prophylaxis, we can accomplish little.

In the prevention of hydrophobia we have three distinct lines to work in: *First*, intelligent laws in regard to animals, particularly dogs; *second*, treatment of the injury by antiseptics and cauterization; *third*, Pasteur method of producing immunity.

We must bear in mind the fact that an animal develops rabies only after a bite by a mad animal. The disease never develops spontaneously in either man or animal. The season of the year bears no relation to the prevalence of rabies. In some statistics, recently gathered, the winter months showed the largest number of cases of rabies. This fact is quite contrary to the popular belief that summer is the season of the year to look out for mad dogs. Upon this erroneous theory many of our dog laws are based. For instance, in New York, dog catchers go out with great enthusiasm and capture stray dogs, beginning May 1 and continue to do so during the hot months. If we make laws which can be carried out all the year round, much good will follow. No dog without an owner should be allowed for a day in New York City. This matter of catching and mercifully disposing of dogs should be put in the hands of the city and vigorously and intelligently enforced every day in the year. We would soon reduce the enormous number of homeless and half-starved dogs seen in the city streets to-day. Every owner of a dog should be compelled to register his dog with a bureau for the purpose, and each dog should be quarantined for at least six weeks after being brought into the city. I believe that muzzling all dogs for six months would at present be desirable; but I do not believe it would be necessary to have such a law continued beyond the six months. In England, by a strict quarantine law against rabies, in one year the disease was reduced in dogs from several thousand cases to nine. There, dogs are absolutely quarantined by government officials for six weeks, and partially so for six months. This record shows what a strict law will do. It is erroneous to suppose that furious rabies is the usual form in dogs. Dumb, or paralytic rabies, is the usual type seen in New York to-day.

The treatment of a bite of a suspected animal is of much importance. If the bite is on the face, it is most serious; other exposed parts of the body, as the hands and arms, are next in importance. The microorganism of rabies, I believe to be fermentive in character, lying localized for at least twenty-four hours, and then infecting the system by way of the nerves and not directly by the blood. The extent of the wound has much less significance than its position and after-treatment. A wound no deeper than a pin scratch may be the cause of an infection. In 3 cases of hydrophobia out of 6 I have had under observation, the wounds were the merest scratches.

In cases of wounds about the face and exposed parts, the patient should be put under a general anesthetic, if necessary, and the wound scrubbed out with a brush, first with green soap, then with bichloride of mercury 1 to 1,000. This should be done as if for an operation. After this, fuming nitric acid should be carefully applied by means of a pointed glass rod. The wound should then be dressed surgically. If no anesthetic has been given, I usually use first cocaine after the scrubbing, then pure carbolic acid followed by fuming nitric acid. This must be done as early as possible; but I have demonstrated by careful experiments with guinea pigs that it is of value even as late as two days. At the end of twenty-four hours I have shown in a large number of guinea pigs that this method will save 91 per cent. of infected cases. If we cannot obtain nitric acid, the actual cautery is next best. It is, however, difficult to see each small point while using

* Read before Bellevue Alumni Society.

this agent. Nitrate of silver, which is so popular, saved only 55 per cent., and therefore should not be used. However, simply cleansing and scrubbing out the wound with soap and water had some effect, saving 31 per cent. of guinea pigs infected with rabic virus. In my series of experiments I found that about 13 per cent. of control animals infected with the virus did not develop the disease. This fact must be remembered, but it does not affect the general result of the experiments.

Treatment, therefore, of the wound, even at the end of forty-eight hours, is of distinct value, and when done within twenty-four hours, and properly done, I believe it to be of more value than the Pasteur method of protecting the system against possible infection. Both methods, however, should be used.

The dog in every instance should be preserved alive, if possible, and kept under observation for a week. Then, if it remains well, there is no danger. If the dog dies, the brain should be preserved for examination and inoculation tests with guinea pigs.

The Pasteur method of protecting the individual against hydrophobia was at first much opposed by the medical profession, but is now generally accepted and is no doubt of much value if begun early.

I shall not describe the Pasteur treatment here beyond saying that it usually lasts from fifteen to twenty-one days, according to the position of the wound and the interval elapsing between the time of the injury and beginning of treatment.

The preliminary treatment of the wound also is taken into consideration when deciding upon the number of Pasteur injections. Children seem more susceptible to the disease, perhaps because they are more commonly bitten in the face.

In closing, I make a strong appeal to the medical profession to study the subject more thoroughly and to act promptly in the preliminary treatment of injuries. But in case the disease develops, never give up hope, as a case has been known to recover. Gowers has reported one and I believe it to be a possibility.

In instances where the disease develops we must prevent the patient from suffering. This can be done by general anesthetics, chloral and morphine. The patient should not be allowed to suffer.

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**Brucine in Chronic Morphinism.**—After having had unsatisfactory results with strychnine in morphine-habit, A. Fromme (Münch. med. Woch., July 7, 1903) resorted to brucine with much better success. One of two ways may be employed: either brucine is given internally in gradually increasing doses while the hypodermic dose of morphine is slowly diminished, or else both drugs are given internally. Not only does the brucine increase the solubility of morphine in the system and thus ensure absorption of the hard infiltrations at the site of injection and more rapid excretion, but it also stimulates circulation and digestion, prevents destruction of the red corpuscles and promotes sleep. The second method is generally to be preferred, since the use of the syringe, in itself an attraction, is at once done away with.

## ADENOIDS, IN RELATION TO AUDITION AND CEREBRATION.*

BY JAMES FRANCIS McCAW, M.D.,

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Since the attention of the profession was called to hypertrophy of the pharyngeal tonsil, the subject has received much consideration and the literature is now voluminous.

In spite of all that has been said and written, there are still many physicians who are not informed as to the remote results of neglected adenoids, and permit children entrusted to their care to mature with incurable defects, which could easily have been prevented with the proper care in childhood.

To one of these—Disease of the Middle Ear—I wish specially to call your attention, and if in what follows I succeed in impressing upon you the importance of these growths as a causal factor in tubal and tympanic diseases, my time will have been well spent. That inflammatory or other obstructive conditions in the nasopharynx have an injurious effect upon the middle ear, is now universally acknowledged by all who are best qualified to judge. If we consider the anatomical relation of these growths, located as they are in the vault and along the posterior wall of the pharynx, filling the space between the Eustachian cushions, blocking the posterior nares and mechanically obstructing free nasal respiration, it should be an easy matter to understand the pathological relation between these and conditions affecting the auditory apparatus. Lymphadenoid disease is usually found in its highest stage of development during childhood, and in some cases is said to be congenital. This is accounted for by the fact that in children all gland structures are more prone to take on pathological changes, and in this particular region are stimulated to greater activity by the local inflammatory process accompanying the acute exanthemata in children. Now add to this the relatively small space in the pharyngeal vault of a child, and we have a picture which cannot fail to impress upon the minds of careful observers the importance of this condition as an etiological factor in diseases of the middle ear and also its influence in aggravating a diseased process already begun.

All investigators and writers on the subject give prominence to the occurrence of ear complications in adenoid disease. It is my opinion, based on observation and clinical experience, *that lymphoid tissue in the pharynx is the most important predisposing factor in acute and chronic suppurative and non-suppurative otitis media and recurring earache in children.* Indeed, the effect of lymphadenoid disease upon the function of hearing begins in childhood, increasing to ado-

* Read at the Annual Meeting of the Jefferson County Medical Society.

lescence and old age, until in many cases audition is almost destroyed.

How are these effects produced and what is the result on the growing child?

It is now quite generally conceded that any cause which interferes with free nasal respiration will in time produce impaired hearing. As a result of obstruction to the passage of air through the nasal chambers, free ventilation of the pharyngeal vault is interfered with, which necessarily produces a rarified condition of the air in this region. Reduction of air pressure is followed by a passive congestion and hyperemia of the mucous membrane, extending through the Eustachian tube to the middle ear. Following this there is swelling of the mucous membrane encroaching upon the caliber of the Eustachian tube, and interfering with ventilation of the middle ear, resulting in depression of the tympanic membrane. This limits the excursion of its vibrations and impairs the function. It is very easy to understand that an inflammatory process can readily be engrafted on a mucous membrane in such condition, and it is a fact of common observation that it does occur in a large number of these cases. Now, as an almost invariable law, where we have a catarrhal inflammation of the middle ear with hypersecretion, it sooner or later becomes infected and we have a suppurative process set up, which in consequence of the closure of the Eustachian tube due to the obstruction in the pharyngeal vault, is very apt to become chronic, carrying with it the possibility of a number of serious and often fatal complications. The location of the growth is important as a determining factor in ear complications. Adenoid tissue situated between the Eustachian tubes, although small in amount, is of far greater danger to the ears than a very much larger amount limited to the upper and posterior portion of the vault. A large percentage of children with adenoids become deaf, in fact, it is one of the most frequent causes of chronic "running" ears in young children. The result of these influences upon the development of the child is unfortunate in the extreme. These children are mentally deficient. A plausible explanation of which is found in the close anatomical connection between the veins of the nose and anterior lobes of the cerebrum. The venous congestion of the nasal chambers, always present from obstruction to nasal respiration, may induce a corresponding congestion in the anterior portion of the brain. The obstruction which these growths offer to the return of lymph from the brain may also act as a contributing factor. The great increase in the mental ability of some children immediately following a thorough removal of the growth goes a great way in substantiating the truth of the obstructive theory. There can be little doubt, however, that the stupidity is made more manifest from lack of attention than from deafness. It seems unnecessary for me to add that the restless and unrefreshing sleep, imperfect blood oxidation and impaired general nutrition, from which these cases usually suffer, are of more than ordinary importance in the physical and mental development of the individual. Children with adenoids are soon fatigued by mental work. The reproof and punishment, ridicule and censure to which the child is subjected in consequence of its deafness are very important factors in determining character.

The writer has tried to indicate in as brief manner as possible some of the conditions dependent upon lymphadenoid disease of the pharynx and call attention specially to its influence upon audition and cerebration, and to show that the mental growth of a child is commensurate with the state of healthful nutrition and physical vigor and point out why the disease under discussion lessens the vital powers and weakens the whole organism. The almost invariably rapid recovery and favorable effect upon the hearing and intellectual field from thorough surgical removal should impress upon us the importance of early operative interference.

## CHRONIC LEG ULCERS.

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This article is intended to outline a few methods of treatment that have been found effective, and to point out some mistakes to be avoided.

It is first necessary to consider some of the etiological factors concerned in the production of chronic leg ulcers, because the treatment will be found to depend very intimately on the factors active in producing the condition. The causes are given in the order of their frequency, based upon the records of almost two hundred cases, personally observed:

1. Varicose veins are by far the most frequent cause of this condition, and these may be divided into three classes:

(*a*) After varicose veins have existed for some time, and especially as the subject nears the later years of life, there appears a certain local dyscrasia in the affected leg. This dyscrasia is due, not only to the defective nutrition, resulting from the lack of pure blood and the removal of waste products, but also because the edema, usually accompanying large veins, tends to the production of an excess of fibrous tissue in the parts. A further loss of normal cell vitality is thus caused, due to a consequent pressure atrophy induced by the combined action of the pressure exerted by the edema and by the contracting fibrous tissue. Now, when an infection takes place in this particular devitalized tissue, either from excoriations produced by scratching eczematous areas, which so frequently accompany this condition; or from slight traumatism, it does not spread rapidly, but finds its field of action prohibited by this excess of fibrous tissue and defective cellular action. The process spreads slowly, and the same causes which prohibited its rapid extension also interfere with its ability to heal rapidly. And the chronic, slug-

gish leg ulcer results. (*b*) In younger subjects, where the varicose lesions have not existed so long, the chronic condition results from a primary acute ulcer. Infection takes place, and finding the tissues and circulation in a more nearly normal condition, spreads rapidly. A tissue reaction starts at once to overcome the invasion. A small round cell infiltration actively walls off the infected area and there results, by a process of proliferating embryonic tissue, a resultant fibrous tissue, which is produced by the struggle of the cells against the active spread of the infection; thus becoming the ultimate factor in producing the change from an acute to a chronic ulcer, in this second class of cases, because as the fibrous tissue contracts it shuts off, to that extent, the blood supply of the parts it surrounds. And so the formation of new tissue to take the place of that lost during the active process is prevented and thus a chronic ulcer is established. We do not consider that in this class of cases the veins take a very active part, except in the later stages, as the above condition may be aided because of the sluggish state of the superficial circulation. (*c*) In phlebitis and periphlebitis, which two conditions usually exist together, either one may occur as the primary state, the other following by reason of the diffusion of the inflammatory condition through continuity of tissue. An ulcer results when suppuration involves the cutaneous surfaces, and may resemble either one or the other of the above-mentioned forms.

2. In syphilis, we must confine ourselves to late ulcerative skin lesions of the lower extremity and gummata of the same, which result in suppuration and accordingly form ulcers. The latter are the most frequent and, of course, both are chronic.

3. Trauma when engrafted upon varicose veins very frequently results in the formation of chronic ulcers. That an ulcer resulting from traumatism in the absence of varicose veins is usually of an acute nature seems capable of ready explanation if the ideas expressed in the above paragraphs are acceptable.

4. Tuberculosis and leprosy, in this country at least, are comparatively rare, and could be more readily considered under chronic inflammations of the skin.

Let us now consider a few simple rules to be observed in the treatment of chronic leg ulcers: (1) Insist on the importance of a proper differential diagnosis, in which practitioners would seem to fail or at least to consider it of no value; (2) avoid all ointments and pastes, relying on aseptic or oftentimes in this condition antiseptic forms of treatment; (3) consider always local and general constitutional treatment; (4) do not despair. The ulcer that absolutely refuses to heal is exceedingly rare.

To continue this for the special treatment: In varicose ulcers we should remove as far as possible the cause. The radical and palliative treatment of varicose veins can be found described in all text-books of surgery. We, therefore, mention here only two measures that can be adapted, and thus indicate their usefulness. (*a*) Radical operative procedures, as just stated, are to be found described in text-books of surgery, but in no case do we think operation should be considered until the ulcer is entirely healed. (*b*) Bandaging, then, is the only means left by which we can control the causative factors in this class of cases. This is one of the most useful and in fact all important means of treatment. In no case use any form of elastic bandage or stocking while ulcers exist; because all such means of support cause to some extent an excess of heat and irritation of the parts. Unbleached muslin bandages 2½ to 3 inches in width and 7 to 8 yards in length are the best. In their application do not resort to a spiral reverse on the leg, for while it gives the most equal pressure, it invariably refuses to remain long in place. A properly applied figure 8 of the foot and leg, making all pressure on the up-turns, gives the best results.

In very sluggish ulcers, curette the surface and incise the edges. In the first class of varicose ulcers, the incision going well through the fibrous edge is amply sufficient for its mobilization. In the second class, where the ulcer is bound down and almost immovable, deep elliptical incisions must be made around the parts in order that they may become movable. These procedures must be accomplished under aseptic or antiseptic precautions, and the parts subsequently dressed for twenty-four hours with a saturated solution of boric acid in water, or hydrargyri chloridum corrosivum, 1 part to 10,000 of water. The purpose of these incisions is twofold (1) by cutting the fibrous tissue to allow the formation of new capillaries, which may supply the parts with blood; (2) by cutting the fibrous adhesions to allow the ulcer to contract toward its center.

Considering this to have been done, or, in the absence of its necessity, let us now resort to stimulating treatment. There are several solutions which lend themselves especially to this purpose. Ointments, except for rare cases, are to be avoided. Many of them are not aseptic. They prevent free drainage, which is bad, as ulcers are only indolent wounds. The bases of ointments, in fact any grease, are not conducive to the formation of granulation tissue, and their removal is likely to destroy as much of the new growth as could have formed since their previous application.

Solutions applied to the ulcers, on sterile gauze, will be found, in almost all cases, to be the better form of treatment. Let us then consider some of these solutions, each one to be mentioned in its order, being a little more stimulating than its precendent. Their formulæ will be given at the close of the paper.

A saturated boric acid solution is useful in those cases which readily become inflamed, but it is rather too mild for use in the majority of cases. (It must be remembered here as elsewhere that we are considering only chronic ulcers. Acute ulcers of course deserve very different treatment.)

Alum acetate in saturated solution is useful in

chronic cases that have become suddenly inflamed.

A 5-per-cent. to 10-per-cent. solution of ichthyol in water lends itself to the same uses.

Chronic ulcers must be stimulated in order that they may heal. In other words, more blood must be brought to them and all necrosed tissues and infective agents removed.

Red wash seems of especial value to bring about these results, and, applied every day, usually produces most marked changes in the character of the wound. Its use, however, must be attended with care, since in a few cases it will be found too active. It will then be well to alternate it with some washing preparation.

Balsam of Peru gauze will be found very efficacious, especially if alternated every few days with the above-mentioned wash. This gauze causes rather finer and apparently more resisting granulations than most other forms of dressings.

Stimulation may also be brought about by some of the milder caustics used at the time of dressing and followed by boric acid solution or some mild form of application to be left in place for twenty-four to forty-eight hours.

For this, a saturated solution of potassium permanganate may be painted over the ulcer, and this washed off with hydrogen peroxide, followed by sterile water and the dressings of boric acid then applied. This must not be used more frequently than every fourth or fifth day, and often causes some pain. Nevertheless, it is attended by most gratifying results in many cases.

*Silver Nitrate.*—The better employment of this remedy is by brushing over the wound surface with a solution of 40 grains of this substance in an ounce of water, or by touching the granulating surface with the stick. This may or may not be washed off, and is to be followed by a wet boric acid dressing.

One or two weeks of such treatment usually shows a marked decrease in the size of the ulcer and improvement in the character of the granulations. It may now be necessary, if the ulcer has again reached a stage of sluggishness, to repeat the incisions around the edge to again start the closing in of the ulcer.

In many cases it will be found necessary to treat the surrounding skin for inflammatory conditions. To best accomplish this, gauze pads saturated with some of the above solutions are placed over the ulcer and then the whole covered with lint upon which is spread such ointment as the cutaneous condition suggests. Lassar's paste is especially valuable.

Rest in bed with elevation of the part is often of advantage, but should only be used as a last resort if the patient is dependent upon his mobilization for his support.

Massage and douches of alternate hot and cold water are useful in all cases. Later, when the ulcer becomes healthy and the granulations reach close to the surface the parts may be strapped with strips of zinc oxide plaster, three-fourths of an inch wide, applied alternately from opposite sides, beginning below and extending well above the ulcer and not allowing the ends to meet within an inch or more. These may be left in place for a week or ten days and give very pleasing results.

Skin grafting is performed in some cases, but the results are inferior to those of the same procedure in case of burns and more acute conditions.

After a cure has been effected, a Raudolph elastic bandage should be worn indefinitely and the leg doused with cold water and rubbed with alcohol every night and morning.

Constitutional treatment consists in hygienic measures as regulative of the diet and bowels and the treatment of other chronic disorders. Tonics containing iron, arsenic and strychnine are valuable, as they stimulate the circulation, improve the quality of the blood, and the arsenic often removes the eczematous tendency which frequently precedes or accompanies the ulceration.

Syphilitic ulcers respond readily to any form of local treatment if they are recognized as such, and active constitutional treatment is carried out. Creolin solution (a half ounce to a pint of water) is, however, especially useful in these cases for overcoming the odor and removing the slough.

In conclusion, let us say that even after large and careful experience, a line of treatment cannot always be selected at first to suit the case in hand, and it is often necessary to change the agents employed, and at times have recourse to ointments and various soothing and astringent dusting powders.

FORMULÆ OF SOLUTIONS.

*Red Wash—*

| | |
|---|---|
| Zinci sulphat | dr. 1 |
| Tinct lavandulæ Co | oz. 4 |
| Aquæ q. s. ad | pts. 2 |

*Lassar's Paste—*

| | |
|---|---|
| Acidi salicylici | gr. 15 |
| Amyli | |
| Zinci oxid | aa. dr. 2 |
| Petrolat q. s. ad | oz. 1 |

*Balsam Peru Gauze—*

| | |
|---|---|
| Alcohol | oz. 1 |
| Balsam of Peru | oz. 2 |

M. et Pour on gauze strips.

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## SOME PHASES OF CRANIAL SURGERY.*

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Without attempting to cover more than a mere fraction of the ground now occupied by cranial surgery I wish to invite your attention to a few points that may prove of interest at this time.

We realize to-day, more than ever, that the complex anatomy and the incomplete knowledge of the physiology of the brain, coupled with the element of uncertainty of diagnosis and operative result, all conspire to make the study of this

* Chairman's Address, Section on Surgery, delivered at the Fifty-second Annual Meeting of the Iowa State Medical Society, held in Sioux City.

branch a most perplexing matter and these features also explain why more headway has not been made and why the field is an unattractive one for the dilettante or the sensationalist.

To learn what to unlearn has, indeed, been one of the hardest problems for investigators to solve and the results have become evident by the fact of there remaining more shattered ideals in the form of rejected fundamental teachings and abandoned operations than in any other branch of operative surgery.

This, however, is true progress. The utter refusal of the present age to be bound down by fallacious tradition has produced remarkable changes within the generation and promises well for the future, but we must not blind ourselves to the fact that, in brain surgery especially, much that we are prone to regard as proven and permanent to-day may to-morrow be ruthlessly condemned. The logical deduction from this is that the work of to-day should rest on a surer foundation and that we should profit by the mistakes of yesterday.

If we carefully analyze the history of the recent past, to say nothing of more remote times, we cannot fail to be impressed with one especially notable fact, namely, that experimental procedures unsupported by a sound pathology have invariably been unproductive of results and, per contra, wherever pathological conditions have received a correct interpretation, there have followed the permanent advances, in cranial surgery. Let me cite examples. Of the pathology of epilepsy we know nothing, but when the era of clean surgery was inaugurated and cerebral localization began to be a little understood it was thought well to revive the ancient operation of trephination for this condition, removing the so-called epileptogenic center in the true Jacksonian, or the depressed area in the traumatic, cases. The immediate results were encouraging, but it has come to be known that almost any operation on the cranium will cause temporary improvement in an epileptic, only to be followed by relapse later, and such proved to be true in this connection. Then a flank attack was made by Alexander, of Liverpool, who, proceeding on the theory that an increased blood supply was responsible for the cortical irritation, sought to diminish it by ligation of the vertebral arteries. This also failed. Later, Chipault, assuming that cerebral anemia was the causative condition, advocated excision of the cervical sympathetic ganglia, for the purpose of augmenting the supply of blood to the brain and this, too, after attracting some attention, fell into disrepute. The three-year limit has been the Waterloo of all operations for epilepsy up to the present time and the results show that it is useless to proceed further until we know something of the real nature of the affection itself. This applies to microcephalus, hydrocephalus, idiocy and general paralysis of the insane, the pathology of which we either know nothing of or else have learned enough about to indicate that the operations devised for their relief were based upon faulty deductions and have therefore very properly been abandoned.

It may, then, very pertinently be asked whether our incomplete conception of the pathology of the central nervous system constitutes the only barrier to progress in its surgery and we must admit that there are other factors to be reckoned with. Of great importance is the matter of cerebral localization, upon which so much light has been shed in the last thirty years and of which so much remains yet to be revealed. It is true that the function of a large part of the cortex has been accurately mapped out in the physiological laboratories. It is also a fact that comparatively little of the knowledge so acquired is available for practical purposes and to harmonize the pathological conditions with the clinical manifestations is one of the unsolved problems of the present which we hope the future will explain. It is coming to be recognized that injuries severe enough to produce focal symptoms at all are generally accompanied by sufficient laceration of the surrounding and distant brain substance, with resultant hemorrhages of various degrees, to render a localizing diagnosis impossible. Krönlein says "In complicated cases without history the surgeon is glad to make a diagnosis in general, or to know on which side to trephine."*

In abscess or tumor cases the same difficulty may be met with owing to the very gradual enlargement of the lesion and consequent adaptation of the brain to the increased pressure. Irradiation fractures, causing hemorrhage on the opposite side from that upon which the injury was inflicted—the modern view of the old *contre-coup* theory—may also prevent a localizing diagnosis by the fact of total paralysis being thus produced. A typical instance of this came under my observation ten years ago. The following is a brief history of the case. A heavy, middle-aged teamster fell from his wagon, striking the posterior part of the right lateral surface of his head upon the hard ground, sustaining a depressed fracture of the posterior lower one-fourth of the right parietal bone, becoming totally paralyzed and comatose forthwith. A large flap was turned back and the fragment elevated. There was slight temporary relief, but the grave symptoms soon recurred and death ensued within forty-eight hours after the injury. At the post mortem it was found that the fracture had followed the lambdoidal suture around the back of the skull to the opposite side until it reached the asterion, when it divided into two branches, the upper of which terminated just anterior to the zygomatic tubercle, the lower again dividing into two branches which ended in the mastoid process. On opening the skull it was found that the left lateral sinus had been ruptured by this fracture, producing a large subcranial hematoma which extended as high as the superior temporal ridge, while under the dura of that side was another

* Quoted by S. C. Plummer in "The Hartley-Krause Flap in Hemorrhage from the Middle Meningeal Artery," Annals of Surgery, Vol. XXXVI, p. 597.

large accumulation of blood, covering the entire hemisphere of the brain.

Lesions in the frontal cortex are devoid of special localizing symptoms, but suppuration in this region may be accompanied by marked cachexia, of which the following case is corroborative: A. B., a boy aged seven years, was kicked in the right fronto-parietal region by a horse, receiving an open fracture close to the pterion and became immediately comatose. The wound was stitched and dressed antiseptically by the attending physician. Coma continued for two days. On the third day measles developed. Recovery ensued without further incident until four weeks after the accident, when the patient began to complain of frontal headache, vomiting at times. The temperature became irregular and occasionally attacks of spasmodic convergent strabismus were noted. There was marked emaciation, with anemia. Seeing him in consultation at 3 A.M. five weeks after the receipt of the injury I found the temperature 98° F., the pulse 110: patient restless but rational and complaining of frontal headache. He was much emaciated. There was no ocular irregularity and the fundus was not examined. The site of injury was tender on firm pressure: the original wound in the scalp was entirely healed. On turning down a large flap a fragment of bone measuring three-fourths by one-half inch was found driven into the brain substance and under it about two drams of pus, which spurted out with some force on removal of the fragment. The opening in the skull was enlarged with rongeur forceps, the flap replaced and efficient drainage provided for. The patient succumbed to pulmonary edema eight days afterward, and no autopsy was performed.

These cases are simply types illustrative of the fallacious import of localizing symptoms. Realizing this, it becomes necessary to consider the only other available method of diagnosis, exploratory operation, and I think that it will be freely conceded that the development of our present technic makes this a much less formidable undertaking than heretofore. By means of the osteo-tegumentary flap it is possible to make the necessary investigation of the suspected area and afterward secure a satisfactory adjustment of the anatomical relations involved. If necessary the entire motor area of one side can be explored through one flap without compromising the subsequent integrity of the coverings. The methodical exploration of the brain for fluid can be carried out either by Fenger's canulated sounds, or better by the use of a thin, slender spatula, which may be inserted in every direction and is equally serviceable to detect the presence of new growth or fluid.

It is well to observe, in this connection, that chemical antiseptics have no place in brain surgery, but the most rigid asepsis is even more essential than in abdominal operations, where we have a peritoneum to cover a multitude of sins. Prolonged exposure of the brain, too, is likely to prove disastrous by the production of profound shock and must always be avoided. The recent work of Horsley and Macewen in the removal of growths in two stages affords a valuable suggestion for the prevention of shock. If we read between the lines of many reports of cerebral operations we cannot but conclude that the patient's welfare would often be better subserved did the operator content himself with trying to do less. I believe that this applies with especial force to the management of open, or compound fractures.

The objects here to be accomplished are: (1) limitation of infection, (2) hemostasis and, (3) relief of pressure. If all of this can be done, as is frequently the case, through the original opening, what is to be gained by systematically performing trephination in each and every case, as so many text-books direct? This point was brought forcibly home to me in a case which had to be treated in very unfavorable surroundings, causing me to hesitate over the question of doing a radical operation and finally deciding in the negative, although the injuries were such as under ordinary circumstances are usually taken to warrant operative interference. The history of the case is as follows: Mrs. M. R., aged twenty-five years, was struck several times on the head with a dull-edged hatchet, rendering her unconscious at once. The head being shaved, I found four separate and distinct open, depressed fractures, one being situated on the sagittal suture midway between the glabella and inion, another about one inch to the right of the external occipital protuberance, the other two close together near the left squamoparietal suture. The fragments were driven through the dura into the brain in every instance except the first mentioned, which was in the superior longitudinal sinus. The removal of all the fragments was done by means of a narrow-bladed forceps and the edges of the openings in the skull carefully examined for depressed pieces, which were elevated in like manner. The wound in the superior longitudinal sinus bled furiously on removal of the fragment; this was controlled by gauze packing, which is the proper and only method of dealing with injuries of these vessels. The other openings were all drained without suturing. Hot sterile salt solution was employed throughout to wash away débris, etc. The patient made an uneventful recovery.

Under no circumstances should the scalp in an open fracture of the skull be stitched when such stitching interferes in the slightest degree with the freest possible drainage. The teaching of some writers that the proper practice is to convert them into closed or simple fractures at once is absolutely pernicious. Every accidental open wound must be regarded as infected and we have no right, in the present stage of our knowledge, to assume otherwise.

Before closing, permit me to plead for the utmost simplicity of technic in all operative procedures upon the cranium and its contents. There is a tendency nowadays to introduce a bewildering array of new and modifications of old appliances into surgical work, not one in twenty of them of any real practical utility. The trephine

is, of course, obsolete and merits no place in a modern surgeon's equipment; its place has been taken by the chisel, the rongeur and the DeVilbiss device. With these, in practical hands, any modern surgical procedure on the skull can be executed. They are inexpensive, can be carried anywhere and may be adapted to other purposes. They do not get out of order, like surgical engines, nor break, like Gigli wire saws. It is quite unnecessary to adopt Schäfer's method of controlling hemorrhage from the scalp by an encircling rubber band; such few vessels as bleed are better caught up at once by hemostats, which then hold down the flap by their own weight and obviate the necessity of an assistant with a retractor. Again, too, would I put in a word for the osteotegumentary flap, it being the simplest method of entering the skull for the relief of middle meningeal hemorrhage, growth or abscess of the brain, or for purely exploratory purposes.

## MEDICAL PROGRESS.

### MEDICINE.

**Aortic Insufficiency after Trauma.**—Severe injury may result in the rupture of an aortic valve where atheroma is present, but it is less commonly known that the same may occur in perfectly healthy valves. Aortic insufficiency follows, but extensive vegetation at the tear may also narrow the orifice. It is generally stated that an exceedingly loud and rough murmur speaks for a traumatic etiology in doubtful cases but this is not always so, according to T. Struppler (Münch. med. Woch., July 14, 1903) who gives the detailed history of a case with a very indefinite murmur. Sometimes, on auscultation, no murmur can be heard at all.

**A Case of Portal Thrombosis.**—As in most cases of portal thrombosis, the one published by O. Schulz and L. R. Müller (Deutsch. Arch. f. klin. Med., vol. 76, No. 6) was of unknown etiology. A constantly recurring ascites, which required frequent tapping was the prominent symptom. Since the patient did not lose any weight despite the large amounts of albuminous fluid which were removed, the fluid itself as well as the organ after death were studied exhaustively. It was found that the secretion of bile does not suffer in portal occlusion, nor are the liver cells changed pathologically, though the entire liver is smaller and its connective tissue proliferated so as to give the organ a lobulated appearance. Where anastomosis between the general and portal systems is insufficient, as in this case, marked ascites follows. But the transuded fluid is not entirely lost for the organism; it is an interesting fact that the parietal peritoneum and the peritoneal coat of the liver undergo extensive changes whereby an increased absorption of the nutritious fluid is possible, thus permitting the patient to remain in comparatively good condition for many months. These changes manifest themselves macroscopically in thickening and microscopically in proliferation of the capillaries, small veins and lymphoid cells in the subperitoneal connective tissue. These alterations are typical for portal obstruction and do not occur in ascites due to general venous stasis. The amount of nitrogen in the fluid was influenced to a certain extent by the character of the food; thus the amount of albumen in 25 liters could be made to vary from 177 to 335 grams. Certain extractives of unknown composition were also present whereas urea, albumoses and peptones occurred only in traces or not at all and the amount of sugar was never more than a few tenths of one per cent. Albuminous food diminished the amount of fluid transuded and vice versa and by restricting fluids, the next puncture could be postponed for a few days.

**Arterio-sclerosis as a Cause of Nervous Disease.**—The frequent presence of arterio-sclerosis as a cause of apoplexy is a matter of common knowledge but it is not as generally realized that many of the temporary and apparently neurasthenic symptoms which occur in men of middle age have also an organic basis in the sclerosed condition of the blood vessels. M. A. Starr (Med. Rec., July 4, 1903) believes that too little attention has been paid to this causal factor of nervous disturbances and a warning of more serious trouble is frequently disregarded until too late. Most commonly a disturbance in the mental action is first noticed which the patients describe as dulness or hebetude. Difficulty in clear thinking, an irritability of temper and lack of control of emotions are manifested. Others complain of temporary sensations of numbness, irregular darting pains, ringing in the ears or a sudden dimness of vision being not uncommon. Thus it is always advisable to examine closely the arterial system of a middle aged man complaining of these indefinite and apparently neurasthenic symptoms. Furthermore, the condition of the vascular walls has an important etiological relation to various spinal cord lesions among which may be mentioned anterior poliomyelitis, bulbar paralysis and ophthalmoplegia. Although most of these cases are infectious in origin, nevertheless vascular disease has been found to be the basis of the lesion by various investigators in the more unusual forms of the disease. Myelitis and combined sclerosis have also been recently found apparently secondary to vascular changes. Diseases of peripheral nerves are also occasionally due to endarteritis in the small vessels which accompany them and neuralgias may frequently be brought into the same category. It is not intended to urge vascular changes as the usual or important cause of these affections but that they should not be overlooked as an occasional factor. In the treatment of these various conditions drugs never seem to be of much permanent use. General hygienic and dietetic measures are as a rule more efficacious. A great variation in the pulse tension is frequently noted and the author believes that there is an internal secretion which regulates this tension. His observations upon many cases of Basedow's disease and myxedema have led him to the belief that the secretion of the thyroid gland exerts a very marked influence upon the pulse tension. The pulse is invariably soft in Basedow's disease in which there is supposed to be an excess of this internal secretion and he has repeatedly noted the constant therapeutic effect of the administration of thyroid extract in lowering tension. Thus in conditions of temporary high tension great benefits are obtained from its use and no matter what the underlying cause may be the effect seems equally reliable. In various cases of migraine and in those conditions of vertigo, headache and confusion of mind which attend a high-tension pulse, and which are associated very often with a lithemic state the addition of thyroid extract to other remedies will give marked relief. For continued use also, when the tension is more constant, the thyroid extract seems to be more beneficial than nitroglycerin.

**Increasing and Diminishing Body Weight.**—The frequency with which the physician is consulted with the hope of rectifying an extreme condition of body weight in either direction not due to pathological causes makes this subject a very important and interesting one. M. Einhorn (Med. Rec., July 18, 1903) enters into the consideration of the amount of food necessary

for the ordinary maintenance of the body weight and the supply of energy for the daily work. It was formerly supposed that the more food supplied to the animals organism the more material was burned up. It has frequently been proven, however, that the organism does not burn up food introduced in excess but rather utilizes it and converts it into fat. On the other hand, the body consumes just as much material even when no food is taken, using up its own substance, fat and muscles. It therefore follows that the amount and kind of food ingested is the prime factor in the solution of this problem. Leanness is met with, although rarely, in persons who are perfectly healthy. They are usually of a vivacious temperament doing a great deal of work and eating only moderately. To increase the body weight one should inquire minutely how the patient has lived, what kind of food and how much he has taken with every meal. A diet list should include as great a variety of food as is compatible with the condition of the case. If the amount of food ingested be sufficient the beverages taken with the meals should be more nutritious. Less coffee and tea and more milk and cream should be taken. Two or three light extra meals may be given with advantage. About one quarter pound of butter should be taken daily. Butter is an easily digested fat and on account of its high caloric value is especially suitable. When the appetite is poor it will generally be found that bread and vegetables as well as milk and eggs can be taken even if a dislike for meats exists. The addition of olives, lettuce and horseradish sometimes increases the desire for meats. A glass of water stimulates the appetite while eating and induces a larger consumption of food. Outdoor life and moderate exercise are of value for the appetite is thus improved and by satisfying it the increased loss of heat through muscular work will not only be compensated but probably an excess of food will be ingested without trouble. To reduce body weight two methods are possible, diminution of the amount of food taken and second, increase of amount of work performed. A rapid and safe method is that suggested by Weir Mitchell who advocates that the person be placed on a diet of skimmed milk alone, with the usual precautions, or at once give skimmed milk with the usual food and in a week put aside all other food save milk and all other fluids. When the amount of milk necessary to maintain the weight is determined it is gradually diminished until the patient is losing a half pound a day unless the decrease is not well borne. Considerable rest in bed is necessary when so rapid a loss is desirable, massage and Swedish movements are also beneficial. Oertel and Zuntz depend largely upon the increased amount of work done. By carefully regulating the amount of work done and the food ingested the regulation of body weight can be controlled to a great extent even when the daily work of the patient is continued and when recourse to these more rapid methods is impossible. In increasing the work the patient should never be allowed to become exhausted. The accelerated heart action and respiration due to the exertion should return to normal ten minutes after beginning to rest. Thus it will be seen that harmful and, at least, very annoying conditions of the body may usually be entirely cured if these simple means (diet and muscular work) be carefully studied and regulated.

**A Case of Syphilitic Polyarthritis.**—The patient dates the primary lesion from five years ago. The course of the disease did not seem to be typical, although the diagnosis is undoubted. A few months before admission to the hospital there appeared suddenly pain in the left great toe, and in the left sole; the next day the pain spread into the ankle of same side; in a week the knee-joint was attacked. The pains were especially aggravated at night. Later on the right knee was invaded. Treatment for "chronic articular rheumatism," though energetically applied for a long time, failed to produce any results. The epiphyseal ends of the bones at the attacked joints were markedly thickened and tender to pressure. Patient walks with difficulty and pain; is hardly able to flex his knees, and is entirely unable to extend them. Passive movements elicit crepitation. Left shoulder-joint appears to be thicker than the right, and abduction is limited to 45 degrees. The muscles of several joints are markedly atrophied. Villanen (Roussky Vratch, April 25, 1903) excluded rheumatic affection in view of the chronic course of the disease, the nocturnal exacerbation of the pains, the absence of any marked alterations in the skin over the affected joints, as well as of any febrile condition during the whole length of the attack, and finally the complete failure attendant on energetic antirheumatic treatment. Tuberculosis of the joints was excluded by the multiplicity of the affected joints, by the fact that no purulent exudations were detected in any of the joints, the low temperature and the absence of tubercular signs anywhere in the system. As a matter of fact the employment of iodide of potassium in conjunction with mercurial ointments improved the condition rapidly and radically. After a series of inunctions the patient began to feel better, gained 23 pounds in weight and walked with comparative ease. The author is inclined to consider this polyarthritis as belonging to the late period of syphilitic manifestations. The patient very likely entered the hospital at the period of transition from the secondary to the tertiary stage; and it was because of this that the mercurial treatment in conjunction with iodine was more effective than the iodine alone, as employed in the beginning.

**Sea Air for Pertussis.**—Though there is still some diversity of opinion as to the specific cause of whooping-cough the malady is pretty generally conceded to be of an infectious nature, say Dhourdin and Lalesque (Jour. de Méd. de Bordeaux, July 10, 1903). Hence the indications for its treatment are deemed by them to be dieto-hygienic, aseptic, microcidal and serotherapeutic. The asepsis of the condition is represented by all the hygienic conditions advised in virulent and contagious diseases generally: Aeration, isolation, disinfection of the apartment and sterilization of objects and clothing belonging to the patient. As to microbicides, but few are of any real service in pertussis and those which have done such excellent service in surgical practice are not available in medical diseases. Inhalations of ozone have proven of real benefit in the hospital treatment of pertussis by L. Delherm, who attributed the favorable influence seen from this method of treatment, to the antispasmodic properties of ozone. The author, however, believes it to be antiseptic as well, and a true germicide in bronchopulmonary affections. To the fact that ozone abounds in sea air the authors attribute the benefit derived in this affection from a sojourn at the sea side and they urge the advantages of such a change of climate in the treatment of pertussis.

**Acetozone in Amebic Dysentery.**—The interest which has lately been extended to this disease in the United States lends value to the report made by R. L. Kurtz (Medicine, August, 1903) of a sporadic case, which the author believes to have been due to infection from cats, an epidemic of the disease occurring among the felines in the town in which the patient lived. The history of the case extends over a period of about two years, the symptoms at the beginning leading to the diagnosis of gastric ulcer, until at a later date the *Amœbæ coli* was discovered in the stools. The emaciation increased and the patient finally died from a complication of causes. The autopsy showed extensive

pleuritic adhesions and numerous small abscesses and also a large cavity filled with pus. There were no evidences of tuberculosis. All the abdominal organs were adherent in a compact mass and several ulcers were found in the colon. There was nothing in the early history of the disease to direct attention to the dysenteric character, and this coincides with the observations of others that there may be severe ulceration of the cecum due to amebæ without dysentery, the stools being normal. In this case it was also probable that there was an infection of the stomach some months before the beginning of the dysenteric attacks. All known forms of treatment were without results and only acetozone given internally and by irrigations (1-1,000), seemed to have any influence. On the eighteenth day after this treatment was begun, the mucus, blood and fetor disappeared from the stools, the temperature was lower and the abdominal tenderness diminished. The patient was, however, in extremis and it is probable that if the acetozone had been employed earlier, the results might have been different and the author also suggests that if the drug were injected intravenously it might reach amebic foci in other organs.

## SURGERY.

**New Operation for Congenital Ectopic Vesicæ.**—The only operaton which really gives good functional results in congenital ectopia of the bladder is that of Maydl, which consists in implanting the floor of the bladder into the gut. Since however a certain percentage of cases are always lost by subsequent ascending infection of the genito-urinary tract, J. BORELIUS (Centralbl. f. Chir., July 18, 1903) suggests in addition, an anastomosis at the root of the sigmoid flexure, between its two limbs, so as to divert the main current of feces away from the site of operation. There was occasion to try this method only once, with good result. The steps of the operation would be as follows: (1) Dissection of the bladder from its surroundings with the formation of a large, elliptical piece of the bladder floor, containing the ureters. (2) Opening of the abdominal cavity sufficiently to permit access to the sigmoid flexure. (3) Lateral anastomosis between its two limbs. (4) Longitudinal incision into the flexure with implantation of the excised bladder wall. (5) Abdominal sutures.

**Biliary Colic Without Calculi.**—It is often found during an operation on the gall-bladder, that the pathological findings are in many cases not nearly as severe as the clinical symptoms would have indicated. The report of two very interesting cases by H. KRUKENBERG (Berliner klin. Wochenschr., July 20, 1903) also shows that attacks of typical biliary colic may be caused by a displaced gall-bladder, without the presence of any other lesions. Operation was done in two female patients who suffered greatly from such attacks and in which no signs of stones or disease of the gall-bladder were found. The fundus of the latter was found markedly displaced and its body stretched out, but there were no adhesions, and the walls were not changed in any way. In each case the gall-bladder was sewed to the abdominal wall and drained after an interval. A complete cure with cessation of all symptoms resulted. The author designates the condition as a migrating gall-bladder and advises operation in every case,—the gall-bladder also being incised to eliminate the possibility of any calculi being present.

**New Method of Appendectomy.**—Various methods have been devised by which the stump of an appendix may be treated so that there will be little danger of subsequent sloughing or infection of the neighboring peritoneum. E. RIES (N. Y. Med. Journ., July 4, 1903) objects to the method of dilating the stump and inverting it because the instrument must be passed into the cecum and withdrawn after the inversion along the serosa of the stump thus exposing the serosa to the possibility of infection. He recommends the separation of the mesentery and the amputation of the appendix about one-third of an inch from the base. The stump is then held by forceps and the escape of the contents prevented by simple traction in the cecum. A fine round straight needle with a thread at the very end of which is a thick knot, is introduced into the stump one-sixteenth of an inch from the cut surface from inside outwards. The needle is then passed back into the lumen of the appendix and on into the cecum and passed out through the cecum about one inch from the base of the appendix. Pulling on this thread inverts the appendix immediately in a most satisfactory way and its serous surfaces are in perfect apposition and are held there by mere traction upon the thread while a second needle, with a cat-gut thread, sutures, in three or four continuous stitches, the serosa of the funnel of the inverted appendix. The first thread is then cut close to the bowel and by gently rolling between the fingers is drawn back into the lumen of the bowel. The mesentery is then sutured over the base of the appendix. The danger from the perforation of the bowel wall has been found to be very slight as the experience with the Connell suture proves. Should a stricture or obliteration of the lumen prevent such an inversion this obstacle may be overcome by simply stretching or perforation and still there would be no fear of infecting the serosa of the appendicular stump.

**Treatment of Fractures.**—The article of D. JORDAN (Münch. med. Woch., July 7, 1903) gives evidence that the author is an enthusiastic believer in the massage treatment of fractures, combined however with immobilization, even where dislocation is absent. The massage consisted in stroking the limb in its long axis from the periphery to the center with increasing pressure, without however manipulating the actual site of fracture. Thus, a Colles' fracture was massaged, then a wet dressing applied and the arm fixed in a simple paste-board or wire splint till the next day when the massage was repeated. This treatment was continued until complete union had set in. Fractures of the forearm and of the condyles and epecondyles of the humerus were manipulated in the same way with the arm flexed to a right angle and in supination during the intervals. In fractures of the olecranon it is well to fix the arm in extension after every sitting, for three weeks; after this the arm is immobilized more and more in flexion. The absence of pain during massage shows that it is properly performed. Of seventy-three cases of fracture of the upper extremity, sixty-seven regained complete use of their limbs; the others, owing to advanced age or systemic disease had slight limitations of movement. Even where there is a constant tendency to dislocation, massage is useful, since it stimulates callus formation. In fractures of the lower extremity, massage is of marked advantage only when the break involves a joint; it should here be used with ambulatory dressings.

## THERAPEUTICS.

**Treatment of Atrophic Rhinitis.**—The employment of acetozone, the new organic peroxide formed from the anhydrids of benzoic and acetic acids, is highly recommended in the treatment of this condition by J. M. BROWN (Medicine, July, 1903), who used it successfully in three severe cases. After removing the crusts, the acetozone is applied and a nasal spray used daily, consisting of a solution of one-half of one per cent. of pure acetozone in a neutral organic oil.

**General Anesthesia with Chloride of Ethyl.**—The advantages of chloride of ethyl—kelene—are set forth

by J. Vanverts (Nord Méd., July 1, 1903). In his experience it allows of easy and rapid anesthesia and is free from the discomforts and dangers of chloroform and ether. The graduated tubes containing from one to two ounces (25 to 50 c.c.) permit an exact knowledge of the amount used, which should not, as a rule, exceed one ounce (25 c.c). The fluid may be used upon a mask or compress, 1¼ drams 5 c.c.) being given; ½ to ¾ drams (2 to 3 c.c.) for children and 1½ to 2½ drams (6 to 10 c.c. for alcoholics) and this dose repeated at five-minute intervals during the operation, to the limit of 25 c.c. It will thus be seen that chlorethylization is best adapted to short operations, though it may be advantageously employed in longer operations as a preliminary to chloroform or ether. By this means the discomforts and dangers of chloroform and ether anesthesia are overcome and a smaller quantity of the latter drugs may be used. Analgesia is produced by one to two inhalations, provided these are sufficiently deep and air has not been inspired; and complete anesthesia generally ensues in three minutes. This is indicated by muscular relaxation and sometimes by dilation of the pupil and abolition of the corneal reflex. Anesthesia continues for three minutes after inhalation of 1¼ drams (5 c.c.) of kelene, when the dose must be repeated if it is desired to prolong anesthesia; but complete analgesia persists for from fifteen to twenty minutes after withdrawal of the drug, the patient regaining consciousness but suffering no pain during the completion of the operation, should it be deemed expedient to continue the work in this condition. Not the least of the advantages claimed for chlorethylization is the absence of initial excitement, in ordinary cases; though a slight excitement—not in the least comparable to that produced by other anesthetics—is seen in hysterical and alcoholic subjects and when air gains access to the patient. Both pulse and respiration are normal in kelene anesthesia. As a rule, nausea is absent when the patient awakens, and no ill effects are felt. An objection to kelene as a general anesthetic is the occasional failure to obtain the complete muscular relaxation essential to the performance of certain operations, such as reduction of dislocations; in which event the operator must hold himself in readiness to continue the work with another anesthetic. The rapidity with which the patient arouses, necessitates repeated doses during the operation; and as the amount given should not exceed 1 ounce (25 c.c.) kelene is ill adapted to long operations. As a preliminary to ether or chloroform it is, however, desirable in more lengthy surgical work.

**Yohimbin as Anesthetic.**—From the article of C. Magnani (Münch. med. Woch., July 14, 1903) it seems that yohimbin possesses unexpected anesthetic properties and that it is destined to play an important rôle in minor surgery. Five drops of a 1-per-cent. solution injected into the arm so as to form a wheal, rendered an incision down to the fascia alsolutely painless. The anesthesia lasted fully 1¾ hours without the appearance of toxic symptoms or alterations in the muscular tonus. Reviewing all the drugs which have been recommended to anesthetize the eyes, it seems that disadvantatges adhere to each of them, so that yohimbin may ultimately fill a long-felt want.

**Antistreptococcus Serum in Erysipelas and Puerperal Sepsis.**—The results of the employment of antistreptococcus serum published so far are so contradictory that no definite idea can be found as to its utility as a therapeutic agent. Ravitch (Prakt. Vrach., No. 25, 1903) presents 2 cases of erysipelas and 2 cases of puerperal sepsis in which he used the serum. The first was a typical case of facial erysipelas in a woman 50 years of age. The disease was in its fifth day of development, spreading rapidly and unyielding to various remedial agencies such as carbolic acid, ichthyol, etc., when 5 drams (20 c.c.) of antistreptococcus serum were injected; improvement followed on the next day, and in the course of a week the patient was rapidly convalescing. In the second case the favorable results of the injection manifested themselves on the third day. Of the puerperal cases the first became septic soon after delivery; when seen by the physician during the third week after confinement she presented typical signs of sepsis, pain in the uterus, daily sweating, offensive lochial discharge; abdomen somewhat distended and pronouncedly painful; 5 drams (20 c.c.) of the antistreptococcic serum was injected, followed on the next day by a double dose; improvement was gradual but undoubted, and in the course of a month the patient was discharged well. In the second case, that of an adherent placenta that necessitated extraction, sepsis was quite pronounced during two weeks, at the end of which an injection of the serum was made; but as improvement was not observed, and the supply of the serum was exhausted, routine treatment was resorted to, until a new supply of the serum was injected on the fifth day. Unfortunately the result of the treatment became obscured through an unexpected complication of pneumonia from grip. However, the patient eventually recovered with a somewhat diminished mobility of the uterus. Notwithstanding the small number of cases in which the serum was employed the results obtained are undoubtedly interesting and may lead to further trials.

**Silver Nitrate Injections in Tuberculosis.**—Good results are reported by H. T. Bass (International Med. Mag., July, 1903) from repeated injections of silver nitrate into the neck over the vagus nerve. Five drops of a 2½-per-cent. solution were generally employed. There seems to be nothing else which is so efficacious in modifying favorably such a large number of symptoms and even in advanced cases the cough and expectoration are always improved. In the incipient forms it has a most powerful influence for the good, bringing about the quite unexpected changes.

**Veronal.**—As excuse for discussing a new hypnotic, T. R. Offer (Centralbl. f. d. ges. Therap., July, 1903) states that in chronic cases of insomnia one is often obliged to run through the entire list to avoid tolerance. Patients will also get accustomed to veronal in time, yet one can bring about a natural sleep with small doses for quite a period. It is best to begin with 7½ grains (half a gram) and to increase the dose daily by ¾ grain (five centigrammes) up to 15 grains (one gram) or until depression the following day shows that all of the drug is not excreted.

**The Pharmacological Action of Optical Isomers.**—That protoplasm has the power of distinguishing between the various isomeric forms of sugar and tartaric acids, is well known, according to A. R. Cushny (Proc. of the Amer. Physiol. Soc., Amer. Jour. of Physiol., July 1, 1903). Fisher has shown that this power is also shared by the ferments. The mammalian tissues also oxidize one of the isomers more rapidly than the other. The author's experiments were performed with levohyoscyamine and the racemic form, atropine. It was found that these acted equally strongly on the terminations of the motor nerves in striated muscle in the frog, on the frog's heart muscle and on the central nervous system in mammals, while atropine had a more stimulant action on the central nervous system of the frog. Hyoscyamine acted almost exactly twice as strongly

as atropine on the nerve terminations in the salivary gland, heart, and pupil in mammals, from which it was inferred that the racemic atropine liberates the two optically active forms when dissolved, and that the dextro-hyoscyamine is practically devoid of action in these organs. This was confirmed by examintion of some dextro-hyoscyamine. It was found that levo-hyoscyamine acts 12 to 16 times as strongly on the salivary secretion as dextro-hyoscyamine, and about 12 to 14 times as strongly on the terminations of the inhibitory cardiac fibers. The terminations of the nerves in the salivary glands, heart and pupil can therefore differentiate between these optical isomers.

**A New Digitalis Preparation.**—An attempt to obtain a uniformly active, sterile and non-irritating preparation of digitalis for subcutaneous and internal administration, has resulted in the production of "digitalone," which is claimed by its discoverer to obviate the difficulties attending the administration of the ordinary preparations of digitalis. In a recent article, E. M. HOUGHTON (Medicine, August, 1903) states the manner in which the drug is prepared and also gives the result of animal and clinical tests. He employed a large number of menstrua for percolating digitalis leaves, the irritating properties of each percolate being determined by injecting small quantities subcutatneously into guinea pigs and chloroforming them some hours later and examining the site of inoculation. Blood pressure tracings from the carotid artery of the dog were also made to determine whether the drug was capable of producing a typical digitalis action. Finally a non-alcoholic fluid preparation was obtained (the menstruum is not, however, stated) which produced characteristic slowing and increased systole of the heart, accompanied by marked increase in blood pressure. As it contained no alcohol or other preservative, chloretone was added (about six-tenths of one per cent.), to prevent bacterial decomposition. The fluid has been adjusted to the strength of a 10-per-cent. tincture by determining the minimum lethal dose per gram body-weight for frogs and comparing the results with those obtained from the injection of known quantities of a standard preparation of digitalis under the same conditions. Animal and clinical experiments have shown that the drug is uniform, non-irritating when given subcutaneously, readily absorbed and produces the typical digitalis action when given per rectum, internally, hypodermically, or intraveneously, is aseptic and remains so if stoppered. The dose is from 5 to 15 minims subcutaneously, 10 to 30 internally.

## PHYSIOLOGY.

**Contributions to the Physiology of Vision.**—Together with other original discoveries connected with the physiology of sight, C. BAUMAN (Pflüger's Archiv, Vol. 95, Nos. 7-8) finds that various colored lights influence the power of accommodation to a varying degree. From a piece of red glass 15 mm. square a vertical strip 1 mm. broad was cut out in the middle; from another piece of glass of the same size and shape but colored blue, a horizontal medium strip of the same size as in the former case was removed. The two sets of colored glass were placed in the stereoscope. Upon looking through the latter the colored glasses naturally appeared superimposed, but the clefts, vertical in one case and horizontal in the other, did not appear of the same breadth. The vertical cleft in the red glass seemed broader than the horizontal cleft in the blue glass. The reason assigned for this phenomenon is that red light arouses the eye to a more powerful accommodation than blue or yellow light. This stronger accommodation is not different from that which the eye exerts in looking at a near object. This stronger accommodation of the eye aroused by red would lead to the conception that in this way the attention of man and animals is stimulated to a considerable degree. If one is unexpectedly brought face to face with a broad red surface one feels distinctly the effort of the eyes trying to accommodate themselves to red, and at the same time is experienced a sensation of fluctuation of the image. This latter results from the apparent spatial change that one thinks takes place in the position of the red surface. The image of this surface is the same as that which would be aroused by that of any other color at a nearer distance, and one therefore has the impression as if the red surface is rapidly approaching; this approach is intensified by the apparent recession of the non-red portion of the picture. That animals are markedly disturbed by red objects has been known for a long time, and this irritation can be easily explained on the basis of the stronger accommodation for red. The bull in whose presence a red cloth is brandished experiences the same impression as man; he sees in the red cloth a rapidly approaching object which he interprets as an enemy, and he rushes forward to meet it. To attribute this stimulus to the fact that the beast imagines he sees blood, is to credit him with an intelligence he does not possess.

**Is there Vasomotor Right-handedness or Left-handedness?**—This question is answered in the affirmative by E. CAVANI (Archives Italiennes de Biologie, June 10, 1903). In an examination of a large number of right-handed and left-handed individuals, he finds a vasomotor reaction more intense and more rapid on one side of the body than on the other. Generally the conditions more favorable to the vasomotor reaction are found on the side of the body more able to put forth the greater muscular effort. The difference in time between the reactions on both sides of the body may amount to one second. Very probably, the vasomotor asymmetry is to be ascribed to the greater permeability or conductivity of the nervous routes in the extremities which have been more freely exercised, without excluding the possibility of the influence of the varying degrees of sensorial excitability in the two halves of the body or the corresponding halves of the brain.

**The Fatigue of the Vasomotor Apparatus.**—The centripetal portion of the vasoconstrictor mechanism and more markedly the centrifugal portion, present a remarkable resistance to fatigue, according to R. SCHINCKEL (Annales de la Soc. de Méd. de Gaud, 1903, No. 3). The author was not able to produce fatigue in the centripetal vasoconstrictor filaments of the sciatic nerve until after at least one hour of tetanization. As to the vasoconstrictor nerves of the spinal cord and of the splanchnic nerve, a prolonged uninterrupted tetanization lasting two hours was not able to produce complete fatigue in the peripheral vasoconstrictor apparatus. During the excitation of the centripetal nerves, the vascular tone is slightly diminished. Fatigue of the vasoconstrictor apparatus is characterized by the appearance of marked undulations of the vascular tonus.

**Physiological Cholemia of the Mother and Newborn.**—The comparative study of the blood of the mother, new-born and umbilical cord, by A. GILBERT, P. LEREBOULLET, and MLLE. STEIN (Annales de Gynéc. et d'Obstet., July, 1903), shows that the blood of the cord contains three times as much biliary pigments as the maternal blood, and the blood of the new-born contains one third as much more biliary pigments than that of the cord. There is therefore a physiological cholemia of the new-born, of marked intensity, although remarkably well borne, and it is this which gives rise to the secondary cholemia of the mother.

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## A TOOTH FOR A TOOTH.

John Bull has most certainly established a reputation for conservatism and business acumen, if there is any faith in tradition, or virtue in heredity. But the latest action of the British war office in supplying false teeth gratis to soldiers, who have lost their own "as a result of active service," can hardly be classed as an exponent of their maxim of looking out for the pennies and letting the shillings take care of themselves. To be sure the amount involved, per head, is not large and the local dentists employed by the paternal government, can hardly regard Tommy Atkins in the light of a very remunerative gift horse, for the contract calls for the extraction of any and all teeth remaining, and the giving of an anesthetic, for which £1 is allowed. The "full sets" with the subsequent treatment of the gums and mouth are to be furnished at prices ranging from £2 10s. to £4 10s., so that the official dentists are much more apt to walk, than to ride in chaises, even if the appointments themselves do not go a-begging.

The weak notes in the harmony of this system seem to lie in the want of any middle register whatever, and are due to the fact that there appear to be no shillings of prevention to render unnecessary many pounds of subsequent cure. The English recruits have to possess a sufficient number of good teeth on joining the army, and the obvious thing to do would be to make sure that they were not allowed to decay. This could be easily accomplished by the appointment of contract dentists at the various military centers, who should examine the teeth of the enlisted men at least twice a year, and see that they were kept in good repair. This, however, is not the war office plan, which seems to be that the rank and file shall wait until they are incapacitated for the want of sound teeth, and then be sent to the dentist for a new set. An exchange of the old lamp of natural teeth, for the new one of artificial brilliancy.

That this might improve the facial aspect of the "Household Guards" is unquestionably true, but if the beneficent government would go a step farther, and give an eye for an eye—as well as a tooth for a tooth—the "Guards" would doubtless present a strenuous appearance, that would carry consternation to an opposing enemy and render the dark recesses of Spion Kop as gleaming and electric as San Juan Hill itself.

What they would gain in appearance, however, they would undoubtedly lose in efficiency, as it is unnecessary to say that the strength and health of men in campaigns depends more on their food, their ability to eat it in comfort and to masticate it thoroughly than on any other factor, and a regiment of men with sound digestions and a good commissariat, is better for practical purposes, than an army with banners. The roast beef of Old England is proverbial for its succulent tenderness, and her plum pudding has hardly to be bitten off or chewed. But neither of these national delicacies is served at the table d' hote of action, and the stalled ox, on the field of battle, is as rare as the contentment, which is popularly supposed to accompany the dinner of herbs.

According to the official army report nearly all the teeth that were lost or ruined in the South African war were damaged by the biscuits. The soldiers averred that they were almost as hard as granite, and that it was impossible to eat them, unless they were soaked overnight, or died, like the classic victim of the Mikado, a humorous death by being boiled in oil. Instances, says this report, are numerous of "men whose teeth were broken to pieces, and who came home with a mouth full of jagged edges."

No one could expect troops that had been exposed to danger and privation, and who had been fed on such fare, to have any stomach left for

either fighting or digestion. It is true that in the earlier days the invading forces subsisted on the surrounding country, and the army in Flanders certainly did not suffer even if it did not grow strong on the fruits of its pillage. But all this was before the magazine rifle had been invented, and in the period that antedates the reduction of "snipping" to one of the fine arts. At the present time the unlucky and starving British straggler would find his prescription for the cure of hunger filled by some substituting Boer, if not with food, at least with what would be more permanent and "just as good."

It cannot, of course, be claimed that the result of any war could have been changed by a previous course of operative dentistry, but it would certainly seem wiser, to the professional mind at least, for England to appropriate money for the preservation of the natural teeth of her soldiers rather than to expend it in the gratuitous distribution of artificial ones. Teeth are not Indians, and the best ones are they that are still alive.

In the event of a night attack, moreover, it would complicate matters extremely to have an entire command turn their trembling hands to the convenient tumblers of water before they even grasped their arms, and should the "two pun' ten" sets be trampled in the ground, it could hardly be expected that they—like the teeth of the dragon of Cadmus—should rise again in serried columns to repel the invading foe.

So, by all means, let the Army dentist attend to his duties in the earlier stages of his military patient's career. Let him back and fill, scrape and bridge, remembering only that uneasy lies the tooth that wears a crown, and that nature is superior to art, in all things, particularly when it is in the mouth of the British Grenadier.

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### GALL-STONES IN THE YOUNG AND ACTIVE.

Since we are still much encumbered with the surgery of our grandmothers all experiments which tend to rid us of the fantastic reasoning and conclusions of their day are most heartily welcome. A roaring moral and intellectual bonfire once in a while not only consumes some of this old timber but lights the way for the finding of new fuel. Nevertheless, while we may be loud in our disapproval of the methods of the Chinaman we are at heart good followers of old Confucius. Who, for example, is there among us whose invective would not speedily be hurled against an iconoclast who should boldly assert that gall-stones were rendered impossible simply by practising the art of the Epicureans or the Romans *after* the fortieth milepost were past!

Copper-fastened, bent in, and clinched in the mind of most practitioners is the time-honored notion that biliary concretions rarely occur in the young and are almost of necessity the misbegotten scions of Bacchus and his genial kindred sprites.

Indeed it is no exaggeration to say that, in the light of our present widespread and generally accepted beliefs, under almost no circumstances would one be justified in advancing exploratory incision, even in supposed cholelithiasis in a youngster of say twenty years!

The decidedly revolutionary conclusion that young, active women from the laboring classes are the most frequent victims of gall-stones is advanced by Dr. Otto Hartmann. His experiments and reasonings are published in a leading article in the *Deutsche Zeitschrift für Chirurgie,* April, 1903.

As early as 1891, Naunyn, at the Tenth Congress for Internal Medicine, held at Wiesbaden, expressed himself as certain that gall-stones were of bacterial origin. It is now universally acknowledged that micro-organisms play a very important etiological part—any negation of this theory having been rendered untenable by the findings of Miyake and Mignot. These antipodeans, working independently of each other, produced artificial gall-stones in the bile tracts of guinea pigs and rabbits, one-half to one year after the introduction of colon bacilli into these passages. Hartmann, working from the opposite standpoint, has been able to demonstrate the presence of germs in over seventy-five per cent. of his recent series of forty-six cases. The work of Herter and others along these lines now shows very conclusively that the concretions in many instances are of bacterial origin.

Having decided this, it becomes of paramount interest to know how the germ obtains ingress. There are three more or less generally discussed paths of transit. The first and most freely admitted is the direct course through the lumen of the papilla of Vater from the germ-laden wall of the duodenum to the absolutely sterile regions of the upper biliary passages. Albeit, this is a short path and one remarkably straight, it is well known that there are numerous valves in the mucous membrane of the ducts which, combined with the normal bactericidal power of the bile, have been considered *the* factors in preventing infection.

A second, and much less probable mode of infection of the passages is through the medium of bands of adhesions through the dilated vessels of which the germs are supposed to flow.

The third, or so-called hepatogenous path of infection is from above downward. It presupposes a general infection of germs and their free distribution in the liver via the blood. That this condition obtains in typhoid is well known and it is after this disease that the concretions are very prone to form. Although the liver is very freely supplied with blood it cannot be looked upon as an organ gravely interested as are the kidneys in freeing the body of the germs—it is no germ-filter. Nevertheless, the very anatomical arrangement of the blood supply favors hepatogenous infection.

It is fair to suppose that any one or all of these three factors may be in operation in a given case. What, then, are the barriers, other than those already cited, which Nature throws up?

It is well known that the activity of a gland varies directly in proportion to its blood supply. In blood, the liver is richer than any other organ save the lungs. In pregnancy and in chlorosis this is distinctly lessened. In like manner, as shown by Ranke, in violent muscular exertions such as are produced by tetanus, the blood flow to the liver is so lessened that its bile output practically ceases.

It is an easy and a natural step from these facts to the assumption that in the laborer so much blood is used by the muscles that not a sufficiency remains for the liver. Indeed, it may well be possible, according to Hartmann, that, particularly in patients whose biliary system is congenitally abnormal, there may not alone be an absence of flow of bile but actually a *negative* pressure. This not alone tends to aspirate the colon or other bacilli from the duodenum—despite the Valvula Heisteri, but to create by the anemia a *locus minoris resistentiæ* where germs might grow apace. So, often between the twentieth and thirtieth years the corner-stone, so to speak, is laid—but the growth is slow.

Symptoms may not develop for ten or fifteen years, but the *disease* is there. These conclusions of Hartmann are of great interest and his tables will reward the most patient study.

## A NEW BLOOD PARASITE.

In addition to the routine activities of a health department, the Montana State Board of Health has undertaken and apparently carried out to a successful issue a very commendable piece of work in the investigation of a peculiar disease known to them locally as spotted fever.

In the Bitter Root Valley there has existed for some time a disease which has been responsible for many deaths and which has created more or less alarm in the minds of the residents of that valley, the cause of which has been attributed to various factors, particularly the water, the mineral and the general conditions of the soil, and by many thought to be due to the snow of the Bitter Root Mountains. This disease, known in Montana as "spotted fever," "black fever," or "blue disease," has been recognized as a clinical entity by the physicians of the region for fifteen to twenty years, the first case having occurred as far back as 1873, from which time to the present over 200 cases of the severe type have occurred, 70 to 80 per cent. of which have proved to be fatal. During the spring of 1902, 18 cases of the disease were observed, 15 of which died.

The disease seems to be confined to the eastern foothills of the Bitter Root Mountains, arranged along the top of which runs the Montana-Idaho State line, and few if any cases have been known to originate in Montana outside of this territory.

The investigation was taken up by Doctors Louis B. Wilson and Wm. Chowning, both connected with the University of Minnesota, and State Board of Health. They entered upon their investigations May 16, 1902, and after a most thorough search found in the red blood cells of the patients suffering from the disease, a new parasite closely resembling the *Pyrosoma bigeminum*, the cause of Texas fever, yet differing from that organism in being larger, and in its larger forms exhibiting active ameboid movements. The absence of pigment from the organism of spotted fever separates it, the authors think, from that of the malarial group and places it in close alliance with the parasites found to be the etiological factors in Texas fever. The investigators, however, prefer to make a more extended investigation of the parasite before determining its exact zoological relationships.

An extremely interesting feature of the observations is shown in a possible relationship of the tick which is found on the gray gopher, *Spermophilus columbianus*, as the chief agent in the spreading of this disease. It is well recognized that this class of insect is responsible for the spreading of Texas fever in cattle and man and the occurrence of an analogous species of tick in the gopher widens still further our outlook on the

relationship of animal parasites to the spread of disease. Furthermore, the authors show that the parasite is found in the red blood cells of the gopher and it is probable that this animal serves as the host of the new hematozoan.

While there are many points to be cleared up before final conclusions can be drawn on all of the side issues relating to "spotted fever," the authors are to be commended for their extremely painstaking piece of work, the credit of which should be ascribed in large part to the enlightened policy of the newly created Montana State Board of Health.

## ECHOES AND NEWS.

### NEW YORK.

**Dr. Alfred Meyer.**—The President of the American Congress on Tuberculosis, to be held in Washington, D. C., April 4, 5 and 6, 1905, announces Dr. Alfred Meyer, of New York City, consulting physician to the Bedford Sanitarium for Consumptives, chairman of a committee in charge of the section on sanitarium treatment of tuberculosis. It is probable that the climatic and other methods of treatment will be comprised under the work of this committee.

**Work of Lying-in Hospital.**—In the month of July the new Lying-in Hospital, at the corner of Seventeenth street and Second avenue, has had 572 applicants for treatment, of whom 135 were admitted and cared for in the hospital wards. The number of children born in the hospital during July was 110. For the same period in the outdoor department, 303 applicants have applied for assistance in their own homes, and 208 patients have been treated in confinement. The number of medical visits made was 880.

**New Bellevue Hospital Now a Probability.**—President of the Board of Trustees of Bellevue Hospital J. W. Brannan on last Monday announced that certain difficulties which had been encountered in connection with the acquisition of the block between Twenty-eighth and Twenty-ninth streets, running down to the East River, had been disposed of, and that the way was now clear for the Department of Charities to acquire the land. The difficulties centered particularly about the dock which the city owns at the foot of Twenty-eighth street, and the dumping ground for the Street Cleaning Department at Twenty-ninth street. It was desirable that these places should continue to be maintained, yet their continued presence meant that the elaborate plans for the new hospital could not be carried out in their entirety. Repeated consultations were had between the Superintendent and Dock Commissioner Hawkes and Street Cleaning Commissioner Woodbury in an effort to find a way out of the difficulty. At last, after close scrutiny of the official maps of the city, it was found that the city and dock rights at the foot of Twenty-ninth street and the dumping ground for the Street Cleaning Department could be moved up a block, to Thirtieth street. With this discovery the solution of the difficulty has been found. A short while ago the Board of Aldermen authorized condemnation proceedings begun to acquire the block in Twenty-eighth and Twenty-ninth streets. The principal building at present on it is the power house of the United Electric Light and Power Company. The company offered to sell to the city their rights in the property for $1,460,000. This was considered too high a price, and the condemnation proceedings were then authorized. The acquisition of this property will remove a nuisance which has long been a source of annoyance to the hospital authorities—the tall smokestack attached to the power house, which frequently emitted big clouds of black smoke, permeating the hospital buildings. President Brannan said last Monday that in all probability work would be begun on the new buildings for the hospital about October. It is planned to start building at the northern end of the site, the Twenty-ninth street end. As soon as one building is ready for occupancy, one of the old ones will be torn down, and so on until all the old buildings have been removed. Mr. Brannan said that the cost of land to be acquired and the sums to be spent to put it into condition for building will amount to about $2,000,000. The site will comprise the lots from Twenty-sixth to Twenty-ninth street and from First avenue clear to the river.

**Hudson Water Favored.**—It was stated at the Water Department last Monday that the preliminary report of the special commission on additional water supply, which was appointed by the Mayor early in the year, will be made public about September 1. Commissioner Monroe said some time ago that the report would be ready about July 1, and the delay is explained on the ground that the Commissioners were asked by Mayor Low to make an investigation of the Jerome Park reservoir, and were obliged to let the water investigation rest for a while. It was stated, also that the report which is expected in September will contain more detail than it was originally proposed to incorporate in the preliminary report. Just what the commission will recommend is not definitely known, but from the best information obtainable it is said that its members have agreed that the Hudson River above Poughkeepsie is the most promising and permanent source of supply for the entire city. The commission has examined all possible sources, but it is understood that the main objection to most of them is that while they might meet the present demands, the growth of the city would, in a few years, render it necessary to again seek additional sources. The main objection to the Hudson River source is said to be expense. To distribute water in Brooklyn, large mains would have to be constructed under the East River, and, it is claimed by many engineers, the water would be so brackish that it would have to be put through an elaborate process of purification before it could be safely consumed.

**A Plea for the Dogs.**—Apropos of our discussion on Hydrophobia, in the Original Articles in the NEWS this week the following letter to the New York *Times* is deemed pertinent. We reproduce the article in full:

To the Editor of The New York *Times:*

DOG ORDINANCE SIGNED.

Mayor Low yesterday signed the dog-muzzling ordinance.

Tut-tut! Likewise avaunt!

As a loyal Columbia man, I had almost taken it for granted that, although the Board of Aldermen would of course put their feet in it, our worthy ex-President could be depended upon to spare me, in the "dog-days," by a wise veto, the bother of buckling on my armor and shivering a lance for the reputation of this town for mercy and justice toward our brute friends.

A time or two in the past I have published in your

columns over the pseudonym of "Quaestor" views upon matters and things which have been so happy as to meet with your subsequent editorial approval. Let me humbly hope for a like fate to-day; after which I will resume my palmleaf fan and be able to look my dog in the eye without fancying therein a look of mute contempt and reproach.

The present agitation, worked up by one of our newspapers during the "silly season," in absence of a better occupation, and helped by misjudged action by the County Medical Association, and resulting in an official scare about dogs, reminds me of nothing so keenly as the spectacle of a lady with skirts closely wrapped about her person standing upon a chair in deadly fear of a mouse upon the floor. That lady is New York to-day.

Of course, rabies does occur occasionally, but chiefly in winter time most rarely when the weather is hottest. The statistics of the Pasteur Laboratory of Paris, quoted by Dr. Ruffer of that laboratory in a report to the British Medical Association (see N. Y. Med. Record, Sept. 28, 1889, p. 357 et seq.), show that the lowest number of cases of mad dog bite occurs in August, the highest number in February.

It cannot be too strongly affirmed that in hot weather, for one genuine case of rabies there are many of supposed rabies, which are due to nothing save the wearing of a muzzle during the heat. Because of this torture (unless the muzzling is a mere farce and utterly useless to prevent biting) the mouth is at least partially closed. In summer this often compels sunstroke, in consequence of which the dog is apt to act queerly—or even to have a fit; whereupon the poor beast is chased and finally shot. The incident is closed by a record in the newspapers of one more case of hydrophobia "in our midst."

Dogs vary in temperament as do human beings. Those of a nervous and excitable nature may temporarily go crazy, as a man of like temperament might become delirious from heatstroke.

May I, with apologies, right here deliver a two-minute lecture upon dog physiology? It is guaranteed to do nobody any harm.

Dogs have no sweat glands. Upon the most sultry day their skin will be found dry. But they must of course lose water to keep cool. This they do from the tongue, which drips steadily, but possibly even more is lost by means of panting. The inhaled air is comparatively cool and dry. The exhaled is hot and saturated with moisture. By these means alone can they accomplish what we do by aid of our sweat glands chiefly. Among human beings it is always the person not perspiring who, if anybody, is in jeopardy of heat stroke. The mechanism whereby a dog in need of cooling his blood makes some 200 or more times per minute the respiratory motion called panting, demands for its performance as nature intended, a wide-opened mouth. With a mouth in which the oscillatory motion of the tongue is restrained even in the least by muzzling, the resultant fatigue, within a short time, is pitiful to witness. It is pure cruelty. Most wickedness begins in ignorance, and this is no exception.

If we must have muzzling, it should be, as a matter of logic, in midwinter since, as I have shown, rabies is commonest then. However, restraint at the end of a strap or chain would seem the proper solution of the problem. I, too, approve of restraint —to this degree, and throughout the year. Also, I am regretfully compelled to agree with the strongly expressed opinion of the late Col. Waring, speaking in his capacity as guardian of the city's cleanliness, namely, "town is no place for a dog."

It is a matter of more than usual interest just now to inquire whether the common expression "the dog days," meaning the heated term, may not in part have helped to fix in the popular mind the mistake regarding the danger from hydrophobia being greatest during that period. Of course, the reasonably well-read know that "the dog days" have no such meaning nor peril. They are forty days, figured twenty before and twenty after the first morning that Sirius, the Dog star, becomes visible before sunrise.

They also have been called "Canicular Days," but Shakespeare uses the expression "Dog Days" for them. When first named and observed, the reckoning was from July 3 to Aug. 11, but the procession of the equinoxes changes this forward a day in each seventy years, and the dog days now run from July 25 to Sept. 3.

The writer of this letter devoutly wishes that the public could be induced to stun by blows, and not kill with bullets, dogs that apparently have gone mad. Afflicted with genuine rabies, the poor animal is certain to die, and quickly. If instead it is heatstroke, abundance of cold water and possibly blood letting may save its life.

If it recovers, think of the relief from mental anguish of those who may have been bitten by the crazed animal, and who now know that they are in no jeopardy of madness: have no need to undergo the Pasteur treatment. Because of the present foolish plan of killing at sight every dog in a fit in summer time, an unspeakable amount of anxiety and dread, most of it wholly needless, is caused among those bitten.

Indeed, there is actually a disease called Lyssophobia (Lyssa is one of the names for rabies), which at times, among the highly strung and hysterical, is capable of killing. It is death from pure fright, with symptoms imagined by the victim to be those he ought to have—such as barking like a dog, etc.

To return to our incubus, the present statute. What are we to do with it? Enforce it? Never! I have too much confidence in the common sense of the citizens of this city, even those in high places, to believe it of them. I appeal from Philip drunk to Philip sober of thought. In an address before us of the Nineteenth Century Club last winter Recorder Goff, in speaking of a wholly different matter, said that there is certainly no lack of laws upon our statute books, as affecting the City of New York. On the contrary, quoth he, there are enough laws existent and unenforced to start a respectable law library!

In view of the facts in this case, as presented herein, am I wrong in feeling that the best way out of a rather shameful situation will be to add just one more—namely, this newest ordinance, to the long list alluded to by our distinguished Recorder? Let it be honored in the breach.

Of course it is admitted that under ordinary circumstances the best way to treat an objectionable law is to enforce it rigidly. Those suffering injustice will be loud in their protests, and a sense of justice will lead to its repeal. But in the present instance the victims cannot ask for fair play.

If it were not asking too much of poor human nature—for it needs the rare quality called moral courage to admit a blunder—I would suggest that the Aldermen should at once repeal this ordinance, substituting therefor one commanding a leading cord, strap, or chain, and omitting all reference to that instrument of torture, the muzzle.

Quaestor.

**The Insane at Bellevue Pavilion.**—The Evening Post very sanely says: "Whatever the insane pavilion at Bellevue may have been in days not so long gone, when many grim and ghastly tales of abuse of patients were made public, there is no evidence on these fair mornings to warrant a belief that it is anything but an efficiently conducted hospital ward. Since the new board of trustees of Bellevue and Allied Hospitals went into office, they have effected many reforms; none of them, perhaps, shows more distinctly when contrasted with former conditions than the present methods of caring for the insane while awaiting discharge or commitment to an institution. Unfortunately, the penny papers have fostered popular superstition about the insane pavilion among the very people who largely fill its beds. They regard it as a place of horrors, and delay putting their friends and kinspeople under treatment, usually, until the police interfere. A visit quickly belies the ignorant and commonly held misconception of the place. The two long wards are specklessly clean and bright, the sunlight coming through the iron-grilled windows, giving the long rooms a particularly cheery appearance. The ward for females upstairs is even brighter, being lighted by skylights as well as windows. Several cages filled with singing canary birds, the big rocking chairs, and the tables, gave the ward the air of a big living room. The sleeping rooms are on either side of the broad hallway extending the length of the building. Despite their cheerful surroundings and the presence of the rosy-cheeked, white-capped nurses going briskly about the morning's routine, the women patients sat gloomily apart from one another.

**In the Male Ward at Bellevue Pavilion.**—In the men's ward there was a more social air. All of the patients, wearing pink pajamas, were in groups chatting softly. One man was earnestly reading the classified advertisements in a newspaper held upside down. He was arrested for writing threatening letters to consuls and port officials reciting alleged grievances. He came by his delusions honestly enough in the "fire hole" of a South American steamer. He was a stoker, and the work, combined with the effects of a spell of fever in Santos, addled the none too deep contents of his brain pan. Except for the woman who cried, all of the patients might have been convalescents from any ordinary illness. The insane pavilion rarely ever comes to public notice, save through the medium of some tragedy or scandal of mismanagement, and account is not taken of the many weeks when nothing untoward happens. Previous to the present administration the patients were in the care of physicians with little experience in the treatment of the insane. During their absence the members of the regular house staff of the hospital performed these duties in addition to their own. This arrangement was so obviously unwise that the new trustees named Dr. F. Packer resident physician and gave him two assistants, Dr. M. S. Gregory and Dr. D. C. MacClymont. All of them had had previous experience in asylum work. A system of hospital treatment has been adopted, so that all cases are given the benefit of the same service as in a general hospital for the care and treatment of the insane. The use of mechanical restraint has been abolished except in cases where it is absolutely essential to prevent injury to the patients or their nurses, and it is only applied on the order of the medical officers. The use of the belt, cuffs and waist straps has been discontinued. Where necessary, a restraining bed sheet and bandages are applied under the direction of the medical officers only. The use of sedatives as a restraint has been reduced to a minimum, and they are only given on the prescription of a medical officer. An increased number of patients have been furnished with employment about the wards and in the performance of other duties to the end of relieving the monotony of their detention. An improved system of case records has been adopted. A report of the physical and mental condition of each patient is recorded. These reports are supplemented by the daily notes of the nurses under the direction of the medical officers, and contain a complete record of all medicines prescribed.

**Changes in Nursing Service.**—In the male ward, the nursing service has also been materially changed. In place of pupil nurses, the patients are now in charge of trained asylum attendants who have been drawn to a large extent from the State hospitals. A carefully chosen woman head nurse has been placed in the ward with most happy effect upon the patients and the atmosphere of the ward. The number of attendants has also been increased, being now in the proportion of one attendant to three, or, at the most, four patients. The number of nurses in the female ward has also been increased. The work of the resident physicians has been greatly helped since the positions of examiners in lunacy were abolished. The employment of skilled alienists made this possible. The fact that the examiners in lunacy had their own private practice and were required to attend at the pavilion for but two hours in the afternoon of each week day, necessitated many delays in the examination of such cases as for any reason were not ready for treatment in those hours. About 2,500 men and women are brought to Bellevue yearly under the belief that they are insane, and the physicians are under the gravest responsibility lest some person who is not really deranged permanently be committed. Only recently a woman who tried to have her husband committed and who told a logical, circumstantial story of his alleged symptoms, was found on examination to be as mad as a hatter. Her husband was detained three days before it was determined that he was sane, and that it was his wife who needed restraint. Another woman who had her husband locked up because of his alleged insanity came to the hospital the following day and threatened to clear out the place unless "her man" was released. She had charged him with insanity in a fit of anger after a quarrel.

## PHILADELPHIA.

**Physicians Fined for Failing to Report Smallpox Cases.**—Two physicians have each been fined $5 and costs by Magistrate Cunningham for failing to report cases of smallpox to the Bureau of Health. One of the cases had been diagnosed as chickenpox.

**Quarantine Upheld by Court.**—Judge Davis, in Quarter Sessions Court, recently dismissed the writ of habeas corpus brought to gain the liberty of Norman R. Hyland and his family, who were declared to be starving to death after a week's smallpox quarantine at their home. The action of the Bureau of Health in denying Hyland, his wife and three children the means to obtain food was said to be due to the man's persistent refusal to have one of his children, suffering from smallpox, removed to the Municipal Hospital. The Bureau of Health justified its action by the fact that the city has a hospital for all such cases. The attorney for Hyland demanded that the man be allowed to work or that the city provide food for the family. After hearing the testimony of both sides, Judge Davis said the case narrowed down to the question as to whether the

Board of Health had a right to quarantine the house. This right was given, the Judge said, in an act of 1818. He declared that if the condition of the family was as stated it was unfortunate. "But," he continued, "if provision is to be made for families under quarantine in their homes, there would be danger of many families being under quarantine for 365 days of the year."

**Pasteurizing Plant in Operation.**—The pasteurizing plant donated by Nathan Straus, of New York, was put in operation August 5. Dr. A. R. Green from the plant in New York said that Philadelphians should be proud of their laboratory as it has larger quarters and is more completely equipped than any other in this country. Branch distributing stations are to be established in different sections of the city. Contributions to the amount of over $2,000 have already been made for the support of the enterprise. The milk will be given free on an order from a physician or recognized charity, but if the persons applying for it are in a position to pay they will be charged a nominal sum. For a six-ounce bottle or under the price will be one cent, for an eight-ounce bottle, two cents, for a sixteen-ounce bottle, three cents.

**Dr. Royer to Head Municipal Hospital.**—Dr. B. Franklin Royer has been selected by Director Martin to be head of the Municipal Hospital. Although a young man, Dr. Royer has had considerable hospital experience, having been chief resident physician at the Jefferson Hospital for the past seventeen months. He is about thirty-seven years old, and a native of this State. He was educated at the Mercersburg Academy, and entered Jefferson Medical College in 1895. He was graduated in 1899, receiving a gold medal and highest honors in obstetrics. He was immediately appointed a resident physician in the college, the first man to be appointed that year, and he served fourteen months before becoming chief resident physician. As chief resident physician, Dr. Royer will reside in the Municipal Hospital, and will give its affairs his undivided attention. Dr William M. Welch will, it is understood, be retained by the Board of Health in a responsible position, where his expert knowledge of contagious diseases will be utilized. It is thought that he can do especially valuable work in connection with the work of the health inspectors.

**The White Haven Sanatorium.**—In a recent article read at the Luzerne County Medical Society, Elwell Stockdale, Superintendent of the White Haven Sanatorium of the Free Hospital for Poor Consumptives, gave some very interesting points regarding the work of that institution. During the first winter their 18 patients slept in a dilapidated barn, the thermometer often below zero and no heat whatever in the building. In spite of these conditions the patients contracted no colds, pleurisy or pneumonia and never since have the results quite equaled those obtained during that period. This is a strong argument in favor of the tent theory for all winter, yet Stockdale would hardly advise anyone to try it. At present the Sanatorium has 100 beds with a large waiting list. All patients whose temperature permits are kept out of doors eight hours daily. On forced feeding every patient is compelled to take not less than four quarts of milk and six fresh raw eggs daily, and many take six quarts of milk and 12 eggs daily, a few even more. They believe that no patient who cannot take forced feeding has much chance of recovery. Breakfast is a light meal served at seven o'clock. At nine o'clock a lunch of milk and eggs is served, and at twelve o'clock dinner, which is the only heavy meal of the day. At four o'clock is given a lunch of milk and eggs and soda crackers, and at seven o'clock supper. The minimum, but not the maximum, quantity is limited. No patient with a temperature above 99½° F. is allowed to move about, and above 100° F. they go to bed. All patients rest in bed not less than ten hours. Some of the gains in weight are remarkable, one man gaining 23½ pounds in twenty-five days. The results are equaled nowhere else, either in this country or abroad. Stockdale says the secret of their success is their method of feeding, the careful individual attention given each patient, and the rigid rules to which all must adhere or leave. Spitting on the ground is made a cause for expulsion. The medication used is europhum in all cases, and varying tonics to aid digestion in most cases. Expectorants when the patient has a cold and creosote in all cases with mixed infection. Whisky is never given. For hemorrhages nitroglycerin is used, and as a precaution against them it is also given when there is an accentuation of the pulmonary second sound of the heart.

## CHICAGO.

**Mortality Statistics.**—Notwithstanding, or because of, the unusual character of the weather during the month just ended, the July death rate, 14.92 per thousand per annum, is more than 16 per cent. lower than the average of the ten previous Julys, which was 17.84. Three other years of the period, however, show lower July rates, namely, 1889, with a rate of 14.45; 1900, with a rate of 14.34, and last year, when the rate was 14.74.

**Better Treatment of Diphtheria by Antitoxin Among the Poor.**—Looking to the better safeguarding of the fund for the antitoxin treatment of diphtheria among those unable to pay for the remedy, arrangements have been perfected during the week whereby the Bureau of Charities will investigate all cases in which the Department furnishes antitoxin free on the claim of poverty. This will cause no delay in administration; the case will be treated first and investigated afterward.

**Typhoid in Chicago.**—There is no doubt that the inhabitants of Chicago attain a certain immunity in using the untreated lake water, and people who have been spending the summer away are more susceptible when they return to the city than if they had remained here. Nearly one-fifth of the typhoid cases are contracted away from the city. Many small towns and cities that are summer resorts along the shore of Lake Michigan and other neighboring lakes have imitated Chicago in their water supply and sewage disposal, except that, instead of the sewer and water intake being miles apart they are only a few hundred feet. There is some risk in omitting boiled water even when on a vacation.

**Milk Supply in Chicago.**—Publicity promotes purity of the milk supply. The publication of the names of delinquent dealers causes increased effort to obtain good milk. The Milk Bureau holds the dealer responsible; it cannot go back of him to the farmer. One result is that 769 samples of milk and cream were tested in the laboratory during the week—one-third of them being brought in by the dealers themselves. Only 2.8 per cent. of these were found below grade, and only 4.8 per cent. below grade from all sources. The improvement is remarkable.

## GENERAL.

**Transmission of Syphilis as a Penal Offence.**—A man has been sentenced to five months' imprisonment in Munich for having knowingly infected a

woman with syphilis. The judgment was based on the ground that a serious injury had been inflicted on the complainant.

**Cancer in Hungary.**—The number of deaths from cancer in Hungary is about 8,000 annually. The Budapest Society of Medicine has appointed a committee to make an inquiry into the distribution and prevalence of the disease in the country. The committee, of which Dr. J. Döllinger is chairman, has issued a schedule of questions on the subject to all medical practitioners in Hungary.

**Rabies in Cats.**—Owing to the prevalence of rabies among the cats of Amberg, Bavaria, the authorities gave orders for a massacre, and not a single cat has survived.

**Mortality and Birth-rate of the World.**—According to a recent calculation, there are 68 deaths per second; 97,920 daily, or 35,740,800 yearly. Births occur at the rate of 70 per second; 100,800 daily, or 56,792,000 yearly.

**First French Antituberculosis Congress.**—This congress will meet in the grand amphitheater of the Faculty of Medicine in Paris, October 26 to 29, 1903.

**Smallpox in Jersey.**—There is a good deal of excitement in Hightstown, a small town near Trenton, because of the existence of smallpox within its limits and the lack of a head to its board of health. Dr. William L. Wilbur, a physician of the town, has been medical director of the board for a long time, but he has come to the conclusion that his private practice will not permit him to give his attention to public health matters and has resigned. Dr. Elmer J. Rogers was appointed to succeed Dr. Wilbur, but he has respectfully declined the honor, and Inspector August T. Skillman has handed in his resignation. Meanwhile, the smallpox has been gaining headway.

**Preacher a Health Officer.**—In an effort to secure a thoroughly clean town for Pottsville, Pa., the Board of Health last Monday elected the Rev. W. D. Williams, pastor of the Congregational Church, as the town's Health Officer. Mr. Williams will wear a policeman's star and uniform and will devote all of his time to the work.

**Chickenpox at Goat Island Naval Station.**—All anxiety over the health conditions at Goat Island naval station, where some disease like smallpox broke out, has passed away, and the place is reported free from any serious sickness, the temporary quarantine being raised. The disease has proved to be chickenpox.

**Another Myth Exploded.**—Some months ago a report reached England from Africa of the discovery of a plant, one of the basil family, which was obnoxious and even fatal to mosquitoes. The story excited interest and was fortified immediately, as all such tales are apt to be, by the testimony of persons who had known the plant all along, been intimately acquainted with its virtues, and had slept in happy immunity from mosquito attack in pestiferous tropical regions, after taking the simple precaution of hanging up a few basil leaves. It has now been proved beyond peradventure that all these yarns were the outcome of a profligate imagination or a malicious intent to deceive. The Governor of Sierra Leone has caused a number of exhaustive experiments to be made, the results of which prove conclusively that the mosquito cares no more for the basil plant than he does for the rights of the individual. If anything, he appears to have a mild sort of liking for it. Certainly he does not try to avoid its presence, or suffer any inconvenience from it. He will perch upon it unhesitatingly, sit upon it while meditating or completing his toilette, and eat his dinner under its shadow with the utmost nonchalance and satisfaction. Even when shut up in a bottle with it he lives for days or until he dies of hunger. But if you get a heap of basil leaves and set fire to them in your chamber, and keep on burning them until the smoke is so thick that you are reduced to a choice between instant flight or death by suffocation, any mosquito who is in your company will exhibit signs of discomfort. He may even swoon, but, so say the scientific experimenters, a little fresh air will speedily revive him. On the whole, the great basil mosquito cure must be relegated to the limbo of exploded frauds.

**Another Mosquito Peril.**—"The announcement of a new and infallible method of exterminating mosquitoes no longer excites more than a languid interest, this week's contribution to science being at least the third of its kind since the summer began," says the Evening Post. "The high note of the alto horn and the parasite with the terrible name of *Agamomermis culicis* have been invoked in vain. We now learn that mosquitoes will die if the X-ray is turned upon them. True beyond a doubt, but has the New Jersey physician reflected that mosquitoes are bound to die even when the ray is absent? The principle of post hoc, propter hoc has certainly been overworked in the discussion of the mosquito problem. The finding in holes and corners of the grisly carcasses of *Culex* and *Anopheles*, creatures whose whole life history may be comprised in a couple of weeks, does not prove the success of destructive agents. It is not to be doubted that, if a man should recite Gray's Elegy to a roomful of mosquitoes, some of his little foes would drop dead even before he reached 'Here rests his head upon the lap of earth.' It may be recalled that Alice, when she was being instructed in regard to the insects of Looking Glass Land, inquired what would happen if the bread and butter fly should fail to find its necessary 'weak tea with cream in it.' 'Then it would die, of course,' replied the gnat. 'But that must happen very often?' objected Alice. 'It always happens' was the gnat's answer. It will not do to forget in our experiments that the same thing is true of the mosquito."

**Missouri Valley Medical Society.**—The annual meeting of this society will be held in Omaha, September 14-15 (instead of 17, as previously announced). This change has been made at the request of the Committee on Arrangements. The Governors of the Knights of Aksarben have asked the members to be their guests on the evening of September 14. Invitations will be issued in due time to all members who signify their intention of being present at this meeting. Those desiring to contribute papers should send their titles to the secretary at once, in order to secure a place upon the program. A symposium on skin diseases will be a feature of the first day.

**The Psychology of Sleep.**—Under the caption of "The White Man's Intellectual Burden," the New York Sun contributes somewhat to the enlivening of the dog days, saying that "a gifted native of Ceylon, P. Arunachalam by name, has just discovered that a chief defect of us Westerners is a habit of wakefulness, or rather an inability to enter into the third order of sleep. As for the first and second orders, we are said to do fairly well. The first, it appears, is plain Western dreaming, or, in the finer language of the East, the discovery of 'an inner world full of intense life and emotion.' The second, unconsciousness of existence, followed, on waking, by the memory of 'a blissful haven of rest'; in plain English, sound sleep. The third is the 'sleep of light,'

otherwise 'luminous sleep,' and it is under the head of 'Luminous Sleep' that the Singhalese philosopher publishes his advice to the Western world. Now it is in this quality of somnolent luminosity that we are so deplorably backward; we can sleep and dream and we can sleep without dreaming and we can dream without sleeping, but what we cannot do is to 'lift the veil of sleep' and let in the light. But there is still hope for us; a few have acquired the habit and what we chiefly need is cultivation. For, as the author of this little pamphlet points out Tennyson, among others, achieved to the third estate by often repeating his own name, till—to quote his own words—'all at once, as it were out of the intensity of the consciousness of individuality, the individuality itself seemed to dissolve and fade into boundless being; and this not a confused state, but the clearest of the clearest, the surest of the surest; utterly beyond words, where death was an almost laughable impossibility . . . . etc. 'If the science of the spirit,' remarks the writer, commenting on this curious autobiographical confession of the poet's, 'were cultivated in Europe as it is in India . . . what heights might not so ripe a soul have scaled, what blessed vistas might he not have opened up to the West!'

"It is pleasant to find the Spectator, of London, considering this most abstruse and interesting suggestion with proper gravity in its physiological, psychological, moral, political and religious aspects, with due consideration of the duties of citizenship, of man in his relation to others and to himself; of the delicate distinction between credulity and faith, the broad distinction between religion and superstition, between civilized nations and savages, and finally between the white and the darker races. The discussion at last is reduced to the 'white man's burden,' which 'more truly even than the guidance of the empire,' is 'the feverish dominion of thought.' And this feverish dominion is, unhappily, disastrous to the estate of luminous sleep, which can coexist only with intellective oblivion. So much for the matter from a political and moral standpoint. What of it psychologically considered? 'In dreams,' says our Eastern teacher, 'we joy, sorrow or rage, as keenly as in the experience of the waking world.' 'Surely not,' answers his sober English critic. 'Tragedies which would madden were we awake, and visions of delights that transcend the beauties and marvels of the material world in their gorgeous pageantry, are all forgotten by breakfast.' True enough; but surely in our sleep we 'joy,' as our Singhalese friend would say, over the most trivial delights, and mourn excessively over sorrows hardly understandable in our waking hours. And what if these dream-joys and dream-sorrows be forgotten on the arrival of breakfast? It is but reasonable that we accept the unities here as we do in what we of the West are pleased to call real life. And though a dream be winged, as Alectryon informed his master on a notable occasion, yet sleep hedges it in and limits its flight. Our manifest duty, then, in order to achieve the Eastern idea of contentment, is to cultivate perpetual sleep—'the sublime and refined point of felicity called the possession of being well deceived.' Herodotus, the veracious, tells us of some nation or other that could nap six months together, and surely with a little practice one might learn to live through the rest of the year in the same comfortable state.

"There is, however, one manifest danger in this proposal. Should we all become perpetual sleepwalkers and frequenters of everlasting night, were there not some risk of a superfluity of dreamers and poets, an excess of that wisdom and omniscience that is at present the possession of a favored few? To vulgarize such knowledge would assuredly be to stir up that old debate, happily set at rest years ago in the Schools of the Decree; whether the bat flying through the translucidity of the horned gate might not, spylike, discover the morphean visions turning and unwinding in circular fashion the thread of the *rete admirabile* that wraps up the *attili* of ill-caulked brains."

**International Society of Ophthalmology.**—The International Congress of Ophthalmology, which was held in Utrecht in 1899, elected Switzerland as the country for its next meeting. The undersigned ophthalmologists have been constituted the organizing Committee of the Congress. They have elected as President, the eldest of their Swiss colleagues, Professor Dufour; Vice President, Professor Pflüger; Secretary and Treasurer, Professor Mellinger, and Professor Snellen, President of the last Congress, Honorary President. The President of the Swiss Confederation, Mr. Deucher, M.D., has accepted the position of honoray president of the Tenth Congress of Ophthalmology. The Swiss ophthalmolgists have enthusiastically received the news of the choice with which the Congress of Utrecht has honored their country. They have joined, and in their name an invitation is sent to take part in the coming congress. As the international congresses of ophthalmology meet every five years, the forthcoming congress will be held in 1904. Lucerne is the town in which the congress is to be held, the dates agreed upon being September 19, 20 and 21. These three days will be devoted to work, the mornings being reserved for *discussions*, the afternoons for practical *demonstrations*. Professor Snellen, Utrecht, President of the Ninth Congress; Dr. Barde, Geneva; Professor M. Dufour, Lausanne; Professor Haab, Zurich; Professor Pflüger, Bern; Dr. E. Landolt, Paris; Professor Mellinger, Bâle.

Colleagues desiring fuller information can obtain it from Walter H. Jessop, M.B., 73 Harley street, London; George Mackay, M.D., 20 Drumsheugh Gardens, Edinburgh; Henry R. Swanzy, M.B., 23 Merrionsquare, Dublin; Dr. De Schweinitz, 1401 Locust street, Philadelphia, U. S. A.; Dr. Coote, Quebec, Canada; Dr. Alfred Osborne, Alexandria, Egypt; who have been appointed correspondents for the United Kingdom and for the United States.

**Tuberculosis Sanatorium at Scranton, Pa.**—The sanatorium for consumptives was opened and received its first patient on August 3. The Society for the Prevention and Cure of Consumption will provide for 15 patients in tents during the summer and will erect permanent pavilions in the fall. It has purchased a 30-acre farm for this purpose, just outside the city limits, which has an elevation of 1,400 feet. Scranton is the first city to provide itself with such an institution by private subscription.

**Obituary.**—Dr. George W. Rolerfort, who was one of the most prominent negro physicians in New Jersey, and a Republican leader of considerable note in Essex County, died in Newark on last Thursday, of a stroke of apoplexy. He was stricken on Wednesday afternoon while in consultation with Dr. Livingston S. Hinckley, at the City Almshouse, of which Dr. Rolerfort was medical supervisor. Dr. Rolerfort had practiced in Newark for thirteen years and had acquired a large and lucrative practice and the respect of the medical fraternity. He was born at Lexington, Va., on June 20, 1860. He became a barber and earned enough to pay a tutor who en-

couraged him to go to Morgan College in Baltimore. During the summer he worked as a waiter at hotels and found at Water Gap a patron who paid for three years' course of study, which ended at the University of Pennsylvania.

Dr. Michael F. McGrath died of consumption at St. John's Church, Fishkill Landing, last Tuesday. His brother, the Rev. John J. McGrath, is pastor of the church. The deceased, who was thirty-five years old, was graduated from St. Francis Xavier College and the College of Physicians and Surgeons of New York.

Dr. Jannat Ernestine Hills died at the Willard State Hospital, Willard, N. Y., on July 11, 1903. She was a member of the medical staff of the hospital since November, 1895. She was born in Auburn, N. Y., in 1861, and was a graduate of the Woman's Medical College of Pennsylvania in 1893. After graduating she was for fourteen months an interne at the Sheltering Arms Hospital in Philadelphia, and afterward on the staff of the New York City Asylum for the Insane at Hart's Island. Dr. Hills was a member of the Seneca County Medical Association and of the New York State Medical Association.

## CORRESPONDENCE.

### OUR VIENNA LETTER.

(From Our Special Correspondent.)

Vienna, July 15.

WOMEN STUDENTS IN ZURICH—AUSTRIAN MEDICAL STUDENTS' CONGRESS—UNIVERSITY LIFE IN BUDAPEST—MEDICAL STUDENTS AND THE ARMY—GERMAN DERMATOLOGICAL ASSOCIATION.

The physicians of Zurich are greatly annoyed at a recently published novel written by Baroness Tlise Frapan. She records therein the observations and adventures of a young female medical student; by the way displays a terrible picture of the Zurich clinics, and especially of the repulsiveness of anatomy. The "Work," which is based rather on vulgar gossips than on scientific researches, or on the writer's own observations, was perused by the director of the Zurich clinics. Professor Krönlein, and he contributes in the *Neue Züriche Zeitung* a sharp and energetic critique, in which he challenges the author's statements on the part of the medical students. The critique was as sensational as the novel itself. The polemic is not yet finished. This was a good opportunity for the male students to assert their opposition to the female students, and the men have requested that women be excluded from the University. This was not complied with on the part of Profs. Krönlein and Eichhorst.

The Austrian medical students have recently held a congress at Vienna, wherein medico-social and educational questions were discussed. At the sessions the professors of the medical faculty of the Vienna University also were present, and at the close the minister of education gave an address. The new regulations relating to the examinations for the "Doctor" degree are especially interesting.

Prof. Benedict spoke of the history of Austrian medical education. He pointed out the merits of Thun, who constructed the system of examinations in the year of 1850. According to these rules there were no compulsory examinations to pass during the course of a school-year. This rational system was superseded by the era of severe superintendence and compulsory examinations were established. The result of this innovation has been that to-day every medical professor complains of *the low level of the examinations.* According to Benedict this system must be abandoned, because it leads to the neglect of the visiting of lectures, and it is a hot-bed for neurasthenia. He urges also the extension of the examining committee, in order to prevent one-sided questions. Billroth himself has said that 40 per cent. of the matter that one must learn for the examination's sake, is to be forgotten. Finally he holds that the half year—which a student must spend in military service—is quite superfluous.

Paul Libesny—a student—the leader of a previous action, which has led to very good results, demonstrated the deficiency of practical education. He urged that the material of country and district hospitals should be used for educational purposes.

Great attention was paid to the address of Prof. Schanta. He portrayed the miserable and insufficient location and staff of the clinics in striking colors. In providing for 3,000 labors (yearly) and an immense number of operations he has only two assistants. He disapproved of the habit of coaching, which is apt to spoil the ambition of the student, and moreover is very costly. It is to be hoped, that in the future, the assistants will receive such good salaries that they will not need to increase their incomes in such a manner.

The next speaker, also a medical student, similarly deprecated the coaching system, which besides other disadvantages induces the student to procure his practical knowledge outside the clinics. Dr. Sachs, a lecturer, on the contrary thinks that coaching, as such, is an important means of medical education.

The professional committee of the Budapest Royal Hungarian University elected at their session held on June 30th for dean Prof. Louis Thanhoffer, the renowned histologist; as secretary, Dr. Arpád de Bokay, professor of pharmacology; as notary, Michall Lenhossek, professor of anatomy; as librarian, Prof. Högyes, director of the Budapest Pasteur Institute.

The Minister of War has decreed that for native students who desire to enter the military service the sums of 480, 720 and 1,008 crowns a year shall be paid to them to aid them in the medical studies, during the last three years.

The eighth congress of the German Dermatological Society will be held at Sarajevo (Bosnia) from September 21st to 23d. The preparatory work will be done by a committee under the supervision of Dr. Lipot Glück, sanitary superintendent. The Bosnian government has not spared expense in encouraging a full meeting. It has provided free transportation to the Society from Bosna Brod (the limit of Bosnia) to Sarajevo and from thence an excursion train through Mostar to Ragusa on the Adriatic sea. Other excursions are also planned. The members of the congress and their families can be provided with full board during their stay in Bosnia and Herzegovina for very moderate amounts. Nominally they will be furnished in first-class hotels with everything except beverages for three days for fifty crowns. On the 19th of September the members of the congress will pay a visit to the urological and dermatological section of the Royal Hungarian Medical Society at Budapest.

Those intending to attend can get full information from Dr. Adolph Erdös in Sarajevo, Austria.

**Static Work and Respiratory Metabolism.**—That the consumption of oxygen and elimination of carbon dioxide are not always proportional to the amount of work performed by the body, is proved by the experiments of A. Bornstein and E. Poher (Pflüger's Arch., Vol. 95, Nos. 3-4). They find that in the case of static work, such as holding a weight out at arm's length, the metaholism does not increase proportionately to the weight carried, but at a greater rate.

## SOCIETY PROCEEDINGS.

### BRITISH MEDICAL ASSOCIATION.

*Seventy-first Annual Meeting, Held at Swansea, July 28, 29, 30 and 31, 1903.*

First Day.

**Presidential Address.—Evolution of Antiseptic Surgery.**—Dr. T. D. Griffiths delivered his address at the adjourned meeting of the evening after the Report of the council and the election of honorary members had been made. His address was in part as follows:*

"I have chosen for the subject of my address the evolution of antiseptic surgery and its influence on the progress and advancement of bacteriology and therapeutics, and the further practical application of our knowledge for the benefit of mankind. This subject is no doubt full of interest to us all, but it is far too long to be treated fully in the short space of time in which I have the honor of addressing you.

"In the first place, I must ask your indulgence to bear with me for a few minutes in reminding some of you of the practice of surgery, as we witnessed it in the best London hospitals some forty years ago. There are probably many of the younger members of the profession who have no conception of the condition and state of things in surgical practice even at so recent a period. During my student days in the latter end of the Fifties and early Sixties the large wards of our hospitals were filled with all sorts of cases indiscriminately—simple and compound fractures, suppurating joints, traumatic, senile, and hospital gangrene, erysipelas, septicemia, pyemia, and cases operated on for accidents and diseases, all of which were dressed by the same attendants. Each ward had its set of sponges for the purpose of dressing wounds, and these were used indiscriminately for the various cases under treatment. There was no such thing as absorbent cotton wool in those days, and great economy was observed in the use of lint. Linseed meal and charcoal poultices were frequently employed to sweeten and cleanse wounds and to encourage healthy suppuration. "Laudable pus" was a sign of good dressing and healthy action!

"The operating theater was often crowded with students from the dissecting room, and at the operations the great surgeon invarably wore, with evident pride, the same old black frock coat, buttoned up to the chin, which was kept ready for the occasion in the anteroom, and which was well stained and saturated with blood and matter. It is unnecessary to give a detailed account of the operations, but I may mention that the sponges which were used in the wards were also used at the operating table. Stout silk ligatures were employed to tie the blood vessels, and were left hanging out of the wound to be pulled at from day to day until they were separated by the process of suppuration.

"I well remember listening on one occasion to a clinical lecture on pyemia, which was delivered by the senior surgeon of a London hospital, who confessed to the students that the causation and vagaries of pyemia were inexplicable. To illustrate this remark, he reminded his class of a strong, healthy young man, who had been admitted to the hospital for a trifling accident, and who died shortly afterward of pyemia, while a middle-aged, drunken abandoned woman in the adjoining ward was convalescent after a serious operation.

"The dawn of antiseptic surgery was now not far off. Schwann's discovery of organic germs in the air led Pasteur to formulate a theory that fermentation is never excited except under the influence of microscopic organisms; and, further, that each particular organism sets up a peculiar species of fermentation. In 1861 Pasteur published the results of his researches on fermentation, and in 1863 he demonstrated that putrefaction was caused by minute organisms suspended in the air. Prior to this oxygen had been regarded as the agent which produced it.

"Lister, now aided by the result of Pasteur's researches, devoted his talent and energies to solving the problem of inflammation and its attendant suppuration in wounds. He was not long in arriving at the conclusion that it was due to decomposition—putrefaction—and he naturally evolved the idea that if decomposition of blood serum and destroyed tissue in wounds could be prevented, Nature would repair the parts much in the same way as she did in cases of simple fracture. He applied this principle to the treatment of wounds in his practice in the surgical wards at the Glasgow Infirmary, and afterward in Edinburgh, and used carbolic acid as his antiseptic agent.

"At the annual meeting of this Association held in Dublin in 1867, Lister communicated to the world the result of his investigation, and clearly enunciated the principles of antiseptic surgery, which we recognize and practise to-day. Naturally the practical application of these principles has since been gradually modified and improved. The use of the carbolic spray, which was at first a prominent feature of Lister's method, was gradually discontinued. It was found very inconvenient in practice, and not so necessary as it had been anticipated, and it was finally renounced by Lister himself in 1887. When the spray was given up greater attention was paid to the purity of the atmosphere in the hospital ward, and more especially in the operating theater, and of the instruments and dressings. Then, by a natural transition, attention was turned to the possibility of asepticism, with the view of discarding antiseptics at operations, and for the dressing of wounds.

"After some experience, not a few argued that the acme of success in surgery could be attained by the proper use of aseptic means. There is no doubt a great amount of truth in this, but not to the extent claimed by the advocates of asepticism. It must be admitted that the purest air which we can obtain in the operating theater contains micro-organisms, and some of these must alight on the surface of exposed wounds. Fortunately, there is far less danger of septic action being set up by micro-organisms floating in the air than by those which are conveyed to the wound by a foreign substance. The reason of this is probably that the pathogenic micro-organisms suspended in the air are less numerous, and, as a rule, less active than those which rest on solid or liquid substances. When no antiseptic lotion or swabs are used the aerial micro-organisms settling in the wound are left to the digestive cells and phagocytes to be disposed of. In ordinary circumstances and with proper aseptic precautions they are able to do so; but it cannot be denied that this delegation of trust to the cells, coupled with the possibility of imperfect sterilization of the skin and materials used at the operation, involves greater risk of disasters (such as are not unknown to some of us) than when antiseptic means are also used. We must be careful that the pendulum does not swing too far to the aseptic side. It is at all times a difficult matter to guard the surgeon's work effectually by means of sterilization against every possible access of pathogenic micro-organisms. Why should one trust to asepticism alone when the position can be made impregnable by the assistance of antiseptics, which are practically harmless to the healing process? It is therefore evident that the acme of safety is secured in operative surgery by the judicious application of the two principles advocated and practised by Lister.

* From advance sheets of the British Medical Journal, by courtesy of the Editors.

"The architect has been very rightly called into service to further the practical application of Listerism. This is especially to be noticed in the construction of modern hospitals, and in the addition of new operating theaters to old institutions. They are invaluable in surgical work.

"Some thirty-six years ago the mortality from major operations in the London hospitals was about 33 per cent. This high mortality, after major operations, is now reduced to about 3 per cent., and, after minor operations, practically to nil, as the outcome of Lister's antiseptic surgery.

**Nursing Institutions and Surgical Homes.**—"We are now doing, with the aid of public charity, all that science up to date can do to help the poor. Let us now consider for a moment what has been done, what is being done, and what should be done to meet the requirements of the middle classes for medical and surgical aid in time of need. Their own homes, or perhaps lodgings are often unsuitable for operative surgery, or for serious medical cases requiring skilful nursing. There are, it is true, many surgical homes in our large towns which are, with very few exceptions, private ventures for profit, many unworthy of recommendation.

**Bacteriology and Immunity.**—"The brilliant discoveries of Pasteur and the evolution of antiseptic surgery by Lister gave a great impetus to the study of bacteriology, with the result that new and unexpected discoveries were made as to the part played by bacteria in nature. We now find that these micro-organisms have a definite and important place in the scheme of nature. They are distinctly separated by gradation from both the vegetable and animal kingdom. They form a kingdom of their own which we may term the 'bacterial kingdom.' Their very existence appears to be antagonistic to both animal and vegetable life. Their object in nature is evidently one of destruction—the breaking up of complex molecules of animal and vegetable substances into simpler combinations. They are Nature's scavengers, and undoubtedly they are the causal agents of all the communicable diseases to which flesh, and not human flesh alone, is heir.

"The varieties of bacteria, differing in size, form, action, character, and power for good or evil, are almost endless.

"The bacteria with which we are familiar measure from $1\mu$ to $5\mu = {}^1/_{25000}$ to ${}^1/_{5000}$ in. If each bacterium measured ${}^1/_{10000}$ in. in length and ${}^1/_{25000}$ in. in breadth it would take 250,000,000 of these micro-organisms to cover 1 sq. in. of glass. These micro-organisms grow with great rapidity—a bacterium may reach maturity and divide or split into two in twenty or thirty minutes. If it is divided into two every half-hour it would produce a colony of over 16,000,000 in twelve hours. It has been shown in the laboratory that the growth and rapidity of production and the character of bacteria depend upon their surroundings, and that their virulence may be attenuated or increased according to circumstances. It is therefore evident that the law of evolution and involution of the animal and vegetable kingdoms applies also to bacteria. Supposing that the evolution of a new species of plant—say an annual—takes 336 years, then if the law is equally applicable to micro-organisms, a bacterium under favorable circumstances would take only one week to run through 336 generations, provided it took only thirty minutes to reach maturity and division, and so a new species might be thus rapidly evolved.

"I wish also to remind you, for the purpose of my argument, of the important fact that a bacterium may have two states or stages of existence. One is the active or vegetative stage, and the other the spore or resting stage. In the latter state, which may be compared to that of a hard nut or seed, it may remain dormant for a long time until the surroundings favor its development into the active state. This, as I shall show, has an important bearing on the treatment and etiology of specific diseases.

"Pasteur's and Davain's discoveries led up to Koch's investigation. Davain discovered bacteria in the blood of animals suffering from anthrax in 1863, thus confirming the observations made by Pollender in 1849. Koch repeated the experiments and finally established in 1876 the causal relationship of bacteria and disease. Tuberculous disease had been proved by Villemin to be inoculable, and in some countries it had long been believed to be infectious, but it remained to Koch to demonstrate, in 1882, that tuberculous disease was due to the agency of a micro-organism. He proved that a bacillus played a part in the production of tuberculosis which is analogous to that which is played by torula cerevisiæ (yeast bacillus) in fermentation. The tubercle bacillus feeds, grows, multiplies and produces its toxin at the expense of the surrounding tissues, very much in the same way as the yeast bacillus feeds, grows, multiplies, and produces its toxin (alcohol) at the expense of the saccharine solution in which it is placed. The principle discovered by Pasteur in the processes of fermentation and putrefaction was proved, after years of close investigation by Koch, to be absolutely identical in the development of tuberculous disease in the animal body. He demonstrated the bacillus in the tissue, and cultivated the organism outside the body, and observed the formation of the toxin. The same remark may be applied to diphtheria (diphtherization). Diphtheria bacillus grows, feeds, and multiplies on the mucous membrane and there forms its toxin.

"If we compare the processes of fermentation, tuberculization, and diphtherization a little further, we may gain an idea as to the nature of immunity, which is far more rational than any of the numerous and complicated theories and suggestions already proposed.

"After a certain stage of fermentation torula cerevisiæ (the fermenting agent) ceases to act, it becomes inert and falls to the bottom of the vat. Tubercle bacilli and other pathogenic bacteria behave in exactly the same manner. After a certain stage of crowding and production of toxin they become inert, and are at last practically killed by their own poison. The same thing happens in the overcrowding of animals.

"When yeast has ceased to perform its functions in the vat the alcohol (fermentation toxin) which it produced, if not protected artificially, is attacked by another bacterium, the germs of which are always at hand, and it is soon reduced to vinegar, which possesses different properties. Even if more must is added to the vat the acetic acid fermentation will continue. It is well known that the toxin produced by one bacterium can be destroyed or metamorphosed by the action of another. Advantage has already been taken of this power by sanitarians for the disposal of sewage, aerobic and anaerobic bacteria being called into service to do the work desired.

"When the pathogenic bacteria are destroyed by their own poison, and when this poison in its turn is metamorphosed into a simpler compound by other bacteria, in the same way as alcohol is changed into vinegar, the patient is convalescent, and as long as the spores of the second bacteria remains in the blood, the patient is rendered immune;* but if the toxin of the first pathogenic bacteria has been removed by the leucocytes or destroyed by the oxygen of the red blood corpuscles, or, in fact, digested, or if the spores of the second set of bacteria are no longer retained in the circulation or tis-

* Rheumatism produces immunity to tuberculosis, and vice versa.

sues of the body, the patient has no immunity. When the germs which secure immunity become attenuated, the immunity is lessened, and when they are destroyed the immunity is lost for the time.

"In convalescence after diphtheria the toxin, which may be called for convenience sake 'diphtherin,' is no doubt metamorphosed, and its toxic character is destroyed by another ferment, and the new or metamorphosed product may be called 'met-diphtherin.' As long as the met-diphtherin, or its causal agent, remains active or dormant, it confers immunity on the individual body which it occupies. Diphtherin antitoxin is the met-diphtherin obtained from the horse's blood, which confers immunity on the human subject. When this is used at an early stage of diphtheria it damages the vitality of the diphtheria bacilli, and reduces their diphtherin to met-diphtherin, which is harmless.

"Pasteur demonstrated that when grapes are ripe in October a large number of the berries and their stems have their skins covered with spores of torula cerevisiæ, ready to develop under favorable conditions. This happens immediately when the grapes are crushed and the solution is kept at a proper temperature.

"He also demonstrated that yeast can be weakened (attenuated) by nursing it in a weak solution of sugar, until eventually it is unable to cause any fermentation.

"We may also study with advantage the processes of sporulation and vegetation of yeast cells, which are analogous to those of pathogenic bacteria. By the process of sporulation the yeast cell contracts and hardens like a grain of corn, and retains its vitality in this condition for months or years. The same is also true of pathogenic bacteria, which exist either in the state of vegetation or sporulation.

"Professor Sims Woodhead pointed out at our annual meeting last year that diphtheria bacilli may remain dormant in the spore stage in the throat for months. This is an important fact worth remembering, inasmuch as it may account for anomalous outbreaks of acute specific disease.

"Considering the rapidity with which bacteria grow and attain their maturity and multiply, and considering how easy it is to attenuate or increase their virulence, it is logical to infer that the process of evolution may be brought about very quickly, as has already been pointed out. It is therefore natural to infer that, under favorable conditions, *Bacillus coli communis* may be developed into *Bacillus typhosus*, both being alike in size, shape, and appearance, and the so-called pseudo-diphtheria bacillus into diphtheria bacillus, which are also alike in appearance, etc.

"Like the ripe grapes with germs of yeast in the dust on their skins and the surface of their peduncles, we also have germs of specific disease about us which only require certain conditions to develop them. The late Sir James Paget, in his memorable address at the International Medical Congress in London, in 1881, dwelt at some length upon the importance of studying the physiology and pathology of plants to help the advance of knowledge of human pathology.

"Nature always works on definite plans, but with ever varying difference.

"Bacteriology has done much to unravel the mysteries of pathological processes, and it will do still more to advance our knowledge of medicine.

**Therapeutics.**—"Both bacteriology and Listerism have greatly helped to advance our knowledge of the action of medicine. Therapeutics have now been raised in many departments from the plane of empiricism to that of science. Peruvian bark, the active principle of which is quinine, was accidentally discovered to be of great value in the treatment of malarial fever. The discovery was the result of observation, but the knowledge gained was entirely empirical. Prior to the discovery of the hæmamœba and the observation of its action on the red blood corpuscles, and until the Listerian property of quinine was ascertained, we had no idea how the drug acted as a curative agent. It is now evident that it acts simply as an antiseptic in destroying the malarial parasites which are conveyed to the human body by mosquitoes, and it is now very doubtful whether it has any other beneficial action as a therapeutic agent. The world is greatly indebted to Dr. Manson—whose name we were glad to see in the last Birthday Honors list—and to Dr. Ross, for their discovery of the part played by mosquitoes in the causation of malarial fever.

*Salicin.*—"Very much the same remarks may be applied to salicin, salicylic acid, and the salicylates, which are powerful antiseptics. The discovery that these drugs were specially valuable in the treatment of rheumatic fever was accidental also. It is now acknowledged that rheumatic fever is due to a micro-organism which probably gains access to the circulation through the tonsils or mucous membrane of the pharynx. Sore throat is a frequent precursor of acute rheumatism. It is probable that scarlatinal sore throat predisposes the patient to infection by rheumatic micro-organisms, over which the salts of salicin have a lethal action.

"*Mercurial Salts* are the most efficient antiseptic agents we possess in surgical practice, and it may be argued that the therapeutic action of mercury, when administered internally, is to be accounted for to a great extent by its antiseptic property; hence its specific action on syphilis, which is now stated to be a bacterial disease. It has been recognized for many years that mercury is a valuable remedy in tonsilitis, which is also, no doubt, caused by micro-organisms. Dr. Jamieson, of Edinburgh, pointed out some years since (British Medical Journal, 1887) that mercuric chloride is most valuable as a bactericide in the treatment of scarlet fever.

"*Arsenic*, like mercury, a valuable remedy, is a powerful bactericide. It has been stated lately, on very good authority, that it is useful in the treatment of tuberculosis. It is well known as a most valuable remedy in malarial diseases. Its lethal action on other micro-organisms, which we have not yet discovered, may account for its therapeutic value in the treatment of anemia, pernicious anemia, skin diseases, and degenerative changes which are attributed to 'premature old age.' It is possible, and very probable, that micro-organisms are active agents in the production of atheromatous changes in the vascular system. We now acknowledge that the deposit of tartar on the teeth is the product of certain bacteria; even the gouty deposit in various tissues of the body should probably be credited to some as yet unknown bacilli. In any case, the facts before us are sufficient to justify the suggestion as a working hypothesis.

"*Iodine* is another powerful antiseptic agent and a cell stimulant favoring absorption of exudative and inflammatory products; as it possesses these two properties to a high degree, and is readily tolerated by the animal economy, it ranks among the most useful remedies we have in our *Pharmacopeia*.

"*Iron* may act as a powerful antiseptic remedy indirectly. In cases of anemia it improves the condition of the red blood corpuscles which are the carriers of oxygen in the animal economy.

"The local treatment of skin diseases, as well as those of the mucous membranes, may be briefly stated to be a judicious use of antiseptics alone, or in combination with some sedative or stimulating agent, as the case may require.

"Time will not permit me even to enumerate, much less to expatiate on, all the antiseptic agents which we have now at our command.

"We now see that Listerism is as valuable in the practice of medicine as it is in surgery.

**Public Health.**—"The practical application of our knowledge for the benefit of the public health has not kept pace with the great progress made in medicine and in surgery during the last thirty-six years. The Public Health Act of 1875, which was very comprehensive and well conceived, has been of great service in improving the sanitary condition of urban and rural districts; but, in spite of the amending Acts, and in spite of the Local Government Act of 1894, it is now clear that both the law and its administration are defective in many points, and the time has come when both should be improved in order to secure for the public the full benefit of the advance recently achieved in the science of hygiene by bacteriology and the principles of Listerism. Thus, while it is true that every urban rural sanitary authority is required to appoint a medical officer of health, the duties and salary of the officer are left to the discretion of the local authority, expect in those cases in which part of his salary is repaid by the Local Government Board. Rural sanitary authorities are generally satisfied with very little more than the exercise of their power of electing their officer and the fixing of a small salary. The officer, who is as a rule a local practitioner, is allowed to limit his own work as he may think proper; and as the tenure of his appointment is precarious, he is naturally disposed, in the performance of his duties, to interfere as little as possible with individual interests; practically he has no power to correct matters which come under his notice.

"A few months since, a conscientious medical officer of health confessed, in a letter which appeared in the British Medical Journal, that he was paid about £50 a year for doing nothing. The principle of action which he had to observe was 'how not to do it.' The medical officer's reports consist principally of statistics—the number of births and deaths per thousand living, the number of deaths from acute specific diseases, etc.—which are, no doubt, very interesting and instructive, but these details could and should be supplied to the Board of Guardians by the registrar of births and deaths. It would be far more to the point if the medical officer of health were allowed or required to report how many houses were badly drained, how many houses were unfit for human habitation, etc. Speaking generally, the appointment of the medical officer of health in a rural district is very little better than a farce, and waste of public money.

"Now it may be argued that sanitation in rural districts is of comparatively secondary importance since in the country there is plenty of space and pure air; and that, in fact, the mortality in rural districts is lower than in the country as a whole. But there are many fallacies in such a line of argument, and I propose to direct your attention to one. It has become too much the custom to gauge the sanitary state of the country by the general death-rate; a decline in the rate has, perhaps, tended to blind us to facts which lie a little below the surface. It is true that during the last thirty years the annual death-rate of all ages in England and Wales has fallen from 22.25 to 16.3 per thousand living, a gain of about 26 per cent.; but the death-rate of infants under 1 year of age has risen nearly 2 per cent., while the birth-rate has diminished. Nearly half the children born are dead within five years. Increased infant mortality and dimnished birth-rate are two ugly facts which are not to the credit of our country or of modern civilization. The increased mortality among infants is due to diarrhea and enteritis, and we find that the increase due to these two causes is seven times greater in towns than in the country. We also find that the mortality from diarrhea is much greater among infants artificially fed than among those which are fed at the breast alone, or in part. No doubt much of this increased mortality is due to the ignorance and carelessness of mothers and nurses; but it is also an illustration of a defect in our sanitary administration due to the optional character of the acts and regulations already referred to. There are in existence model rules and regulations for the cleanly and sanitary conduct of dairy farms, which, though they have been approved and sanctioned by the Local Government Board in England, are not adopted, or, where they have been formally adopted, are not enforced in rural sanitary districts. The medical officers of health of our great cities complain that, owing to the neglect of rural sanitary authorities, the milk supplied for consumption, especially in the poorer quarters of large cities, is often either decomposing or putrescent.

"The illustration which I have given shows that we must regard our system of sanitary administration as a whole, and must not be content with enforcing sanitary precautions in the cities while neglecting their application in the country districts, from which those cities draw their supplies.

"Notwithstanding the defects in the administration of the Public Health Act, the country is often under a debt of gratitude to sanitary authorities and medical officers of health for protecting our shores from the invasions of plague and cholera from time to time. The importation of plague to Glasgow and to the London Docks, a couple of years ago, is still fresh in our memories, and we have not yet forgotten the feeling of relief we experienced when we were assured that the causal agents had been destroyed and that we had safely escaped a terrible calamity. Great credit is due to the sanitary authorities for their promptitude, energy and determination in the performance of their duty on these occasions. The same may be said of our local authorities generally when an epidemic of smallpox, typhoid fever, or some other infectious disease attacks a populous district. Unfortunately the public is apathetic in these circumstances; it must be hard hit, and many lives must be lost, before it wakes up to realize the situation, and give material help to the medical officer. We are indifferent and accustomed to the endemic and preventable diseases which are always with us, persistently destroying a large percentage of the population. This may be attributed to three causes: (1) The absence of a strong central authority; (2) the ignorance, apathy, and prejudice of the smaller authorities; (3) the objections and the loud protestations of faddists and conscientious objectors to vaccination, objectors to the Contagious Diseases Act, objectors to the advancement of medicine by experiments, etc.—a class of persons who, regardless of the consequence to others, claim freedom to do as they please in matters pertaining to health, freedom to do what is unjust and wrong, freedom to endanger the lives of others.

"And this is allowed in Great Britain, the land of liberty! Gentlemen, this is not liberty, it is undue license and abuse of freedom. Liberty means freedom and security, freedom of action and security to person and property, freedom of action with due regard to others. These conscientious objectors, of whom there are many species in the world, repudiate the conclusions and recommendations of our Commissioners. They claim freedom to break one of the Ten Commandments, and they also disregard one of the great moral principles of Christianity; and, moreover, they are allowed

to have a voice in the Government and the country, and considerable influence in Parliament! It is high time the country should be rid of this tyranny of faddism and ignorance which is responsible for the loss of tens of thousands of valuable lives every year.

"In obedience to the influence of democracy, the tendency of legislation for many years past has been in the direction of decentralization. Unfortunately this has been carried a little too far in the case of the Public Health and Local Government Acts. A healthy reaction is now much to be desired. The Sewage Commissioners, who are gentlemen of the highest abilities, have recently reported, and have pointed out 'the need of setting up a central authority.' All the various committees appointed by the Local Government Board to consider and report on questions relating to food, questions of preservatives, coloring matters, beer materials, and adulterations of food products have made similar recommendations—namely, the necessity of setting up a greater central authority to secure intelligent coordination and direction and a satisfactory administrative control.

"Here the matter ends. The recommendations of commissions and committees are put on one side. Questions affecting the health of communities and of the nation at large are presumably not urgent! Both Parliament and the country are more interested and concerned in trivial and sentimental questions of religious teaching in Board schools than in the physical and mental development of our children. The Opposition, whichever party be in power, apparently prefers wasting the Legislature's time in wrangling over a dispute between a set of recalcitrant quarrymen and their employer to devoting itself to an amending Act to secure better health, longer life, and greater comfort to the community for which they legislate.

"It is evident that the reform we need is greater central authority and greater power to county councils over public health administration within their respective areas, and for this purpose it appears to me that the following scheme would meet the case:

"1. That the President of the Local Government Board should be raised to the rank of Secretary of State, on an equality with the Home Secretary, for the purpose of improving the status of the central authority. It is true that Mr. Long is a member of the Cabinet: but that is not due to the fact that he is President of the Local Government Board.

"There is, I understand, an agitation going on at present to establish a Ministry of Public Health. This at first sight appears to be the very remedy required; but on second thought it is evident that this would defeat its own end and prove a retrograde step. We must remember that the administration of public health in this country is almost entirely local; and we must not forget that the local administrable business of the country, for which the Local Government Board is trustee, and the business of public health are inseparable; it therefore follows that an independent Minister of Health would be in constant collision with the Local Government Board, and the result would be friction and a deadlock.

"2. (*a*) That the county councils, urban and rural sanitary authorites should be under compulsion to appoint medical officers of health who should be precluded from private practice. (*b*) That the county councils should also have power to compel the combination of small sanitary authorities into conjoint areas sufficiently large to secure the services of an efficient medical officer who should give his whole time to public health work. In short, a public health service should be developed to provide the efficient medical officers of health, who are absolutely necessary. The service should be sufficiently tempting to induce some of the best talent in the profession to enter it. The young medical officers of health should begin their work in rural or less important districts, to be promoted, according to merit and seniority, to higher or more important posts with increased salaries. The appointment, in the first place, should be competitive; the tenure of office should be secure; and there should be provision for superannuation. The medical officers of health should have competent sanitary inspectors as at present; their duties should be specified, and they should have the power to carry out the work prescribed for them, very much in the same way as responsible officers in other services. Every medical officer of health should be provided with a bacteriological and chemical laboratory, and the services of an analytical chemist. Laboratories of this kind, properly equipped, which are now few and far between, would also be an invaluable help to general practitioners and specialists.

"One of the duties of the medical officer should be to deliver popular lectures on sanitary questions, and hygiene generally, in his district for the purpose of educating the public on the vital importance of observing the ordinary laws of health. The sanitarian motto should be that which the late Lord Beaconsfield once gave to his party, 'Educate—Educate—Educate.'

"Although it is well to advocate the establishment of sanatoria for the cure of tuberculous diseases, it is far more important and much more logical to go to the root of the evil at once and teach the public the importance of healthy houses, good drainage, proper ventilation, hygienic dressing, and wholesome diet. Prevention is better than cure.

"*A Modest Estimate.*—A moderate improvement in our present sanitary administration would, no doubt, result in a reduction of 1.5 per 1,000 living, in our annual death-rate. Supposing then that the population of the United Kingdom be 40,000,000, the saving of life would amount to 60,000 a year—a total of 1,200,000 in twenty years. A creditable asset even to the British Empire."

### Second Day.

**Infective and Infectious Diseases.**—Dr. F. T. Roberts, of London, gave the address in medicine on this subject. He said in part that it may be taken for granted that when the pathological factor or factors which directly originate a particular disease or group of diseases, about which there had previously been but vague theories and hypotheses, have been definitely recognized, and their true nature established, we may claim that a distinct and important advance in knowledge has been gained. This applies emphatically to the whole range of complaints with which I am now concerned, for the term "infective," according to modern teaching, has come to have a very precise pathological signification, founded on a scientific basis, and the outcome of the researches and experimental investigations of Pasteur, Lister, Koch, and their followers. To this doctrine the medical faculty generally, with but comparatively few exceptions, have given their cordial and uncompromising assent. It affirms that every infective disease is the result of the direct action upon the body of one or more living pathogenic micro-organisms or bacteria, and in many instances it has been positively demonstrated that a specific organism is the cause of a particular disease, and of no other. It must be clearly understood that according to this definition the term "infective" is not synonymous with "infectious," which implies that a complaint is capable of being communicated, either by direct inoculation or contagion, or indirectly in various

ways, from person to person, or from some other animal to man. In short, an infectious disease must be infective; but an infective complaint is not necessarily infectious. He continued thus:

"I need scarcely remind you that a number of contagious diseases have long been known to be due to obvious or easily demonstrable parasites, animal or vegetable, and it is interesting to note in passing that the investigations of recent years have added, and are still adding, to this list, of which actinomycosis may be cited as a conspicuous example. The organisms we are now dealing with, however, are on an infinitely more minute scale, and the profession as a body have to accept in the main what trained bacteriological experts tell us about them, their toxins, pathological effects, antitoxins, and other details. The theory of *contagium vivum* is of very ancient date, but the positive demonstration of the nature of the so-called virus was only started, and has been progressively accomplished well within the last half century; while the investigations which are still going on in all directions are adding daily to our knowledge and to the practical results following therefrom. These investigations, however, have shown that there are still not a few difficult questions to be solved, and we must be on our guard against too hasty conclusions or generalizations on insufficient data. It is a remarkable fact that in the case of some of the most prominent infectious diseases with which we have long been familiar, no definite or specific organism has thus far been recognized, at least so as to be acknowledged by competent and reliable authorities, and we cannot accept the alleged discoveries of such organisms in individual complaints, unless and until they have received the stamp of the approval of such authorities. At the same time we may be certain that they exist, and this fact may be accepted as the basis of a sound working hypothesis.

"When we look back upon the history of medicine during the past half century, but more especially during recent years, we can not avoid being struck with the additions which have been made to the group of infective and infectious diseases, and with the way in which others, though previously known, have come so much more prominently to the front. The multiplication of these complaints has been partly due to the differentiation of diseases which were formerly regarded as identical, as the result of careful and systematic clinical observation and post-mortem examination. It is, however, to the revelations of bacteriology that we mainly owe these additions, which in the first place have brought all inflammatory, suppurative, and septic conditions within the infective group. Among special medical diseases coming under these categories which, according to modern views, are thus definitely classed as infective, may be mentioned pneumonia, rheumatic fever, gonorrheal synovitis, possibly rheumatoid arthritis, malignant endocarditis, certain acute throat inflammations, and different forms of meningitis. But, further, bacteriology has proved conclusively that several unsuspected complaints or morbid conditions, are infective or even infectious, of which the most remarkable are tetanus, tuberculosis, and malaria. Influenza and diphtheria are striking examples of infectious diseases which seem to have developed into terrible scourges within living memory, though they are by no means new complaints, and their prevalence can be easily explained in the light of modern knowledge. Anthrax and glanders have come to the front because they illustrate in a remarkable way certain important points relating to the pathology of micro-organisms. Glandular fever, specially studied in this country by Dawson Williams, is an interesting addition to the acute infectious diseases. I have already alluded to malaria, and I wish now to draw special attention to the fact that the effects of this condition, as well as several diseases always known to be infectious, such as cholera, dysentery, plague, and yellow fever, which originate and prevail chiefly in tropical and subtropical countries, and with most of which we as a nation had formerly little or no direct concern, have nowadays assumed a conspicuous prominence, and have become of extreme practical importance. New diseases belonging to this category have also been, and are still being, brought to our notice, such as blackwater fever, Malta or Mediterranean fever, trypanosoma, sleeping sickness, and beriberi. So important have they become that 'Schools of Tropical Medicine' have been, as you are aware, established in different places for those who need special training in relation to these diseases. The free intercommunication which now exists between Europe and tropical countries, many of them far distant, has brought them to our very door, so to speak, and we are compelled to deal with them seriously, and to do what lies in our power to cope with them. And more especially Great Britain as a nation can not ignore these complaints, as many of the regions in which they prevail form an integral part of this vast empire. We are, I presume, most of us 'Imperialists' nowadays, but in this relationship, at any rate under existing circumstances, no one dare be a 'Little Englander!' We can not evade the responsibilities which the Imperialistic sentiment brings with it with regard to these terrible diseases, whether from the point of view of humanity and philanthropy; of trade, commerce, mining industries, or other remunerative enterprises in which this country is now so actively and widely engaged; of military engagements; or of Christian missionary work. In this connection I can not refrain from calling attention to the itelligent, far-seeing, disinterested, and truly patriotic efforts made by our distinguished countryman, Sir Alfred Jones, a native of Carmarthen, to promote the study of tropical complaints on the spot, as well as at the Liverpool School of Tropical Medicine, and to do all in his power to endeavor to diminish their prevalence and gravity, or even to exterminate them altogether.

**Practical Etiology.**—"I now proceed to deal briefly with certain points relating to what I may term the practical etiology of infectious diseases. With this aspect of the subject all members of the profession, whatever their position or sphere of work may be, are unavoidably and deeply concerned; and there is hardly any branch of medicine in which greater or more beneficent progress has been made, thanks mainly to those who have worked in the various departments of public health, and who have taken an interest in sanitation.

"Now the first question to be determined from the point of view of practical etiology is whether a particular disease is infectious, in the true sense of the term, or not? As I have already remarked, some affections have been in modern times definitely proved to come under this category, which previously could not be so regarded on any scientific grounds, of which tuberculosis is a conspicuous example. The dogmatic statements made on this point about other diseases, which seem to be undoubtedly infective, such as pneumonia and rheumatic fever, must, however, be received with caution until further and more extensive inquiry has been made, though in the meantime it may be well to regard them provisionally as infectious under certain circumstances, and to act accordingly. At the same time we should not ignore or forget the ordinary causes which long experience has taught us are capable of exciting these diseases, such as chill produced in various ways.

"In the next place, it is very desirable, with regard to each individual infectious disease, to have as definite a knowledge as possible concerning its period of incubation; the degree of infectiousness; and the period of infectivity, that is, how long infection lasts in a particular case? In relation to many of the best known affections belonging to this group, these points have been now established fairly accurately, but there is still much to be done in this direction. As regards the degree of infectiousness, undoubtedly the gradations in this respect between different diseases are by no means so clearly recognized as they ought to be, even by the profession sometimes, but more especially by the laity, and consequently one can not help being struck with the want of proportion and tendency to exaggeration exhibited in the way in which certain of these complaints are dealt with. For instance, phthisis is really nowadays looked upon by the large majority of persons as if it were a most virulent infectious disease, equal to smallpox or scarlet fever, which is of course absurd, but the idea has none the less got a firm grip, and is doing an infinite deal of serious harm in different ways.

"The most important and striking advance which has been made in relation to the practical etiology of infectious diseases is in our knowledge of the sources, modes, and channels of infection, both generally and with reference to individual members of the group; of personal predisposing conditions; and of the external circumstances which favor or promote their endemic and epidemic prevalence. On these matters our information was, within my own recollection, extremely vague and indefinite, and many most significant facts, with which we are now quite familiar, were utterly unknown and even unsuspected, except by a few intelligent observers and earnest workers.

"The question of the communicability of certain infectious complaints from person to person through the atmosphere is an extremely important one, especially when a number of individuals are aggregated together; as well as the distance to which the contagium can be thus conveyed, and the agencies which assist in its dissemination. This question is by no means settled in not a few instances. Let me refer more particularly to typhoid fever and smallpox. While typhus fever has always been regarded as a disease strongly infectious from person to person, typhoid fever has been practically dealt with by the large majority of the profession as being free from danger in this way. Now, however, the tendency undoubtedly is, and probably rightly, to be much more careful as regards enteric from this aspect, and there is a growing objection to the admission of typhoid patients into the ordinary wards of general hospitals. Smallpox is still more important. Of course it is a fact familiar to all that this complaint is highly infectious through the atmosphere, but how far it can be thus carried, particularly from a smallpox hospital or hospital ship, and the influence of winds in conveying the infective agent, is another matter, and may involve troublesome or even momentous consequences. I have noticed in the medical press recently directly contrary opinions on this question, expressed by those who apparently have had equal experience and opportunities of arriving at a practical conclusion. How far emanations from drains, sewers, defective water-closets, and the like, can produce so-called 'blood poisoning' and other indefinite infective conditions, is another question which needs clearing up.

"Passing now to the more practical results of modern investigations as to infection, the following facts are worthy of special attention:

"1. As a starting point infective micro-organisms have been found and demonstrated in the blood; in certain secretions: in the excreta, urine as well as feces; in the cutaneous structures or shed epithelium; possibly in the expired air; and in specific lesions, morbid products, and discharges from the body of various kinds. Hence we can readily understand how and why most of the diseases with which these organisms are associated are likely to be transmitted from individual to individual; how the infected materials may contaminate fomites, and be thus conveyed far and wide; how they retain their activity in a dried state for an indefinite period, thus rendering apartments or other places infectious; and how they may be 'airborne,' being carried about by atmospheric currents or winds, and afterward either inhaled or swallowed by persons, it may be, far removed from the original source of infection, remote epidemics being thus not uncommonly originated.

"2. The communicability of certain grave diseases by the contamination of drinking water in different ways, but especially by admixture of infected excreta, is an established fact the importance and far-reaching consequences of which it is impossible to estimate or realize in any adequate degree. Why such contamination should take place is often obvious enough, but it is rather startling to be told, as we have been within a recent period, that unsuspected and most inviting 'spring water' may be a highly dangerous source of enteric fever. I have a very vivid recollection of an epidemic of cholera, and another of enteric fever, in Carmarthen when I was an apprentice, and in the light of modern knowledge there can be no doubt but that they were the result of infection through an excellent 'spring water' in common use, which had become contaminated with the specific excreta. While we are now all so familiar with the dangers of infected water, it required some hard teaching to convince the profession and the laity of its reality, and we ought never to forget the excellent work done by Snow Beck, Ballard, and other pioneers in relation to this matter. Even at the present time, moreover, my experience has led me to the conclusion that these dangers are by no means always appreciated as they ought to be, and I have met with not a few glaring instances of the injurious effects of ignorance or carelessness. In this connection I may refer for a moment to the vigorous and praiseworthy efforts of my former pupil and friend, Dr. Leigh Canney, who at any rate is fully alive to the evils and risks of water infection, to establish a Royal Water Corps as a special section of the R.A.M.C., the functions of which it would be to prevent enteric fever, dysentery, cholera, and diarrhea. It does not look, however, as if his project had 'caught on' with the governing bodies, and no doubt there would be serious practical difficulties in carrying it out.

"3. One of the most striking additions in modern times to our knowledge regarding the conveyance of infection is in relation to food. In this connection milk and its products stand out very prominently, not only on account of their frequent contamination by infectious materials, probably mainly from the deliberate addition of tainted water to milk, but also because this valuable food may convey organisms directly from diseased animals by whom it is secreted. No doubt you are all familiar with the present controversy as to the communicability of bovine tuberculosis to the human subject in this way: but, notwithstanding Koch's dogmatic negative statement, more recent investigations, prominent amongst them those of Professor Hamilton, of Aberdeen, and Mr. McLaughlan Young in this country, seem to have demonstrated conclusively that this authority, in spite of his high scientific claims and standing, is entirely wrong. At any rate it would be a grave mistake to act on Koch's view, or to ignore in the

slightest degree the possibility of the conveyance by milk of the infective agents of tuberculous or other diseases. I will merely allude in passing to the probable danger in some cases of infection through meat, fried fish, uncooked vegetables, or various foods accidentally contaminated, as from being kept in infected rooms, or it may be by winds carrying organisms from a distance. But what shall I say about shellfish? Dare I whisper in this neighborhood the word 'oysters'? Unfortunately there can be no doubt but that these 'luxuries' are not uncommonly potent agents in originating enteric fever; and the same statement applies to the more humble and democratic mussels, cockles, or even periwinkles, as well as possibly to lobsters, crabs, and the like. May I venture to suggest that it is extremely desirable for all concerned, that everywhere the utmost precautions should be taken to prevent as far as possible these most desirable and valuable articles of food from being contaminated by sewage of any kind; and the deliberate feeding of oysters on such materials, for commercial purposes, can not be too strongly condemned, and ought to be put a stop to by the most stringent legal measures.

"4. The rôle which different animals play in the transmission of infectious diseases to man is another aspect of the subject upon which modern observations and researches have thrown remarkable light. Of course the relationship in this respect of such diseases as hydrophobia and glanders has long been recognized. The idea of direct infection through the milk or flesh of infected animals is of comparatively recent date. The danger of infection being carried directly by domestic animals, such as birds, cats, and dogs, from person to person, or perhaps because they themselves are suffering from certain diseases, is not yet appreciated as it ought to be. The rôle played by such unwelcome 'large vermin' as rats and mice in relation to plague, and probably some other complaints, is now familiar to all. Flies, cockroaches, and the smaller but too well-known personal vermin may no doubt be instrumental in conveying infection in certain cases, and flies may thus taint food. But the most remarkable and important revelations which modern investigators have given us as to the transmission of infection by animals are those relating to mosquitoes. The discovery and demonstration of the connection between these minute torturers of humanity and malaria, in which Sir Patrick Manson and Major Ross have taken such a prominent part, has already worked incalculable good, and promises in the future to revolutionize the conditions of life in many parts of the world, to the inestimable advantage of the communities who are native to the district, as well as of Europeans whom circumstances compel to reside there. The same statement applies to yellow fever, and probably to other affections prevailing in climates and localities where mosquitoes abound.

"5. The question of the relation of infection to soil, place, and particular houses or groups of houses, is a very important one, but about which there is at present much that is uncertain and indefinite, and that needs to be worked out more fully before any positive conclusions can be arrived at with regard to individual diseases. The fact that the tetanus bacillus comes from the soil, being especially associated with garden earth or horse-dung, is well established, and was a most interesting and important modern discovery. Beriberi is regarded by Manson as a 'place disease,' due to a toxin produced by a living germ operating in some culture medium outside the body. Of course, houses or rooms may, when once infected with the organisms of well-known diseases, retain them indefinitely, and thus be the means of originating similar affections after long intervals.

"6. Another most important aspect of infection, from a practical point of view, is the fact that we are every one of us always carrying about in various parts of our bodies microbes, which while habitually innocuous and non-virulent, may under favoring conditions, so far as they are concerned, become extremely virulent, or possibly specific, to our personal undoing; or we may even be harboring in our mouths, throats, noses, ears, and thereabouts specific germs by which, quite unintentionally, we are liable to infect others at any time, while we ourselves go scot free. It is certain that very dangerous germs may lie dormant for an indefinite period in the human body, such as the bacilli of diphtheria, influenza, or tubercle, or their spores, and either lead to unexpected auto-infection, or to the corrospending specific disease in others. When suppuration is set up in any part of the body, moreover, it is wonderful how disagreeable the different organisms can be, in the way of migrating to various other structures, and producing a similar condition in connection with them.

"7. I must just refer, lastly, to the progress made in our knowledge of the channels of entrance of microbes into the system, and the modes in which they are disseminated. Here again the mouth, throat, and neighboring parts come into unpleasant prominence, especially the tonsils, in connection with scarlatina, rheumatic fever, tuberculosis, actinomycosis, and other diseases. The dissemination of the organisms by cells, the blood stream, and the lymphatic channels is also an important fact positively demonstrated; and in this dissemination embolism not uncommonly plays a conspicuous part.

"I now pass on to refer briefly to other modes of investigation not uncommonly of much diagnostic value in relation to infectious and infective diseases, which are also comparatively easily practised, and are supposed to be carried out more or less as a matter of routine in ordinary medical practice. I allude to physical examination, especially as applied to the chest and abdomen; and examination of the urine. Of course, in the clinical study of many inflammatory diseases and special affections now included under this category—for example, pneumonia or cardiac rheumatic manifestations—skilled physical examination is essential; while it is also of great help in the detection of complications and sequelæ, to which it must be noted attention may not be attracted by any prominent symptoms, and consequently they are very liable to be overlooked unless the practitioner is constantly on the alert to detect them by the systematic employment of this method of investigation. The necessity for examining the urine at frequent intervals would, I suppose, be generally recognized in scarlatina, or perhaps even in diphtheria, for well-known reasons; but this measure is not always carried out so regularly or systematically as it might be in other complaints of an infectious nature. As a special test applied to urine I may remind you of Ehrlich's 'diazo-reaction' for typhoid fever; but it is not reliable, even when present, as it may be met with in other affections.

"The special methods of diagnosis applicable to infective and infectious diseases which modern scientific researches have brought so prominently before the medical profession have naturally attracted great attention and excited keen interest. It might be thought an occasion like this would afford a most suitable opportunity for discussing these methods at some length, and endeavoring to estimate their practical advantage up to the present time and their future possibilities. I have preferred, however, to devote most of the time I could give to the clinical aspect of my subject to the more common modes of investigaton, for reasons already sufficiently indicated. I have, therefore, left myself but

little space to deal with these more scientific methods, which I may remind you often require the help of an expert before their results can be safely relied on. I shall content myself with merely giving the following summary of these methods and their objects, mainly coming under the head of bacteriological diagnosis. They include:

"1. Examination of the blood, both as regards its normal constituents, especially the number of leucocytes and the relative proportion of different kinds of cells, the blood plates, and the presence of abnormal corpuscles; and from a bacteriological point of view. The spirillum of relapsing fever and the malarial parasites are prominent examples of pathogenic organisms found in the blood, and the latter have to be observed and studied during the changes they undergo; along with their effects upon the red corpuscles and the formation of pigment.

"2. The further detection and microscopical demonstration of organisms, specific or non-specific or both, either obtained from the tissues of the body; or contained in secretions, feces and urine, various discharges, sputum being particularly noteworthy, and other morbid products of different kinds, fluid or solid, of which diphtheritic material is a conspicuous example. The organisms are not only identified by their morphological characters, but also as a rule by their peculiar staining reactions.

"3. Separation or isolation of the microbes, which are afterwards grown on suitable media, in order to obtain cultures, the results being often highly characteristic, both to the naked eye and on microscopic examination.

"4. Application of the 'segregation' and 'agglutination' tests in relation to the blood serum of the patient, which is most familiar to us in Widal's test for enteric fever.

"5. The observation of the effects on the individual of the inoculation of certain products of the specific microbe of the disease from which he is supposed to be suffering, as in the so-called 'reaction test' with tuberculin for tuberculosis.

"6. The pathological results of inoculation of animals, either with the organisms themselves or with their toxins, which in some instances are essential for positive and accurate diagnosis, lesions of a definite and characteristic nature being thus produced, as is well-exemplified by diphtheria.

"A rather awkward question, but one of extreme practical importance to the profession, has been recently forced upon our notice, which I can not altogether pass by. In the British Medical Journal for March 7 an abstract is given of a disquieting statement issued by the Hospitals Committee of the Metropolitan Asylums Board as to the number of cases of mistaken diagnosis sent to the Board's hospitals as notifiable during the three years 1899-1901. The subject is very ably, fairly, and sensibly dealt with in a leading article in the British Medical Journal of March 14, on the 'Diagnosis of Notifiable Diseases,' which might be read with advantage by all who are directly interested in the question, or indeed even by the laity generally. They do not in the least realize the difficulties which confront the practitioner, with whom I have the deepest sympathy; and residents at the infectious hospitals can not be too careful and particular not to hurt the feelings of their brethren in the profession more than can be possibly helped. Of course any carelessness in diagnosis in relation to infectious diseases is inexcusable; but really young practitioners are not responsible for the fact that they are not so familiar with these complaints clinically as would be desirable, and that many of them have to gain the requisite experience after they have entered upon their active professional duties. May I venture to suggest that while the modern medical student has immense advantages, he labors under a decided disadvantage from this point of view, as compared with those of us who served an apprenticeship, and became familiar with at any rate the more common infectious diseases, even before we started upon our regular studies at a medical school. As a matter of fact he gets very little opportunity of gaining practical knowledge of most of these complaints during his period of studentship, and has to fall back upon so-called 'post-graduate instruction,' if he desires further and more special training and experience."

**Treatment.**—Speaking of the advances in treatment he dwelt particularly on

1. *Hydrotherapy and Allied Methods.*—"No doubt you are aware that Dr. James Currie of Liverpool, to whom I have previously alluded, strongly advocated and carried out the treatment of fevers on a considerable scale by baths and douches. This treatment fell into practical desuetude, and, indeed, was generally looked upon with aversion and dread. In modern times, however, it has not only been revived, but numerous other methods for applying cold to the body, either generally or locally, have been added, not only by means of water, but also of ice and cold air. These methods are now generally recognized and extensively adopted, probably more on the Continent and in the United States than in this country, even in the treatment of many of the ordinary fevers, but especially in the more severe cases; and the local application of ice is strongly advocated in acute pneumonia and other inflammatory infective diseases. While of great value as antipyretics they have other important beneficial actions, which I need not now specify. Regarding hydrotherapy and allied measures in the treatment of infectious diseases, I would remark that every medical practitioner ought to be familiar with them, and be able and ready to carry them out when required. The milder methods, such as sponging the skin or applying ice locally, are easily practised, and are often of the greatest service. Personally, however, I do not advocate or employ the more severe methods as a routine system, as many do; and I feel sure that I have met with serious injurious consequences from such a practice. On the other hand, their essential value in saving life under grave conditions can not be too strongly insisted upon.

2. *Use of Alcohol.*—"I now come to a question in relation to the treatment of infectious diseases and cases, both generally and individually, which demands the most thoughtful consideration, namely, that of the administration of alcohol. And I feel bound to take this opportunity of stating emphatically that when we, as members of the medical profession, approach from any point of view this alcohol question, we ought to do so under a deep sense of responsibility, but at the same time rationally and without undue bias one way or the other. At a large political meeting held not very long ago an eminent statesman was contrasting imperial with local questions, and giving his own ideas about their relative importance, founded upon certain personal experiences. Amongst the local questions he mentioned 'temperance reforms,' and his allusion was received by the audience with loud laughter! I venture to say that such is not the spirit in which this grave subject ought to be regarded at the present day by any community; and, at any rate, the medical profession as a body is bound to sympathize with and encourage every effort made in this country to check the terrible evils produced by intemperance, which confront us in such overwhelming and appalling degree on all hands in our daily expe-

rience, and to do our utmost to promote sobriety amongst all classes, however hopeless the task may appear to be. And from this point of view we should always be most careful to avoid ordering stimulants to patients not accustomed to them, unless they are, in our individual opinion, really necessary; while it is well always to give very definite instructions as to their administration. There is an influential body of the medical faculty in this and other countries, some of them of the highest professional and scientific standing, who absolutely and entirely object to the use of alcohol under any circumstances, and for these ladies and gentlemen I entertain the highest respect. As you are probably aware, an 'International Medical Manifesto' against the use of alcoholic liquors was issued a short time ago, which roused resentment and a strong protest on the part of some members of our profession. To a certain extent I share their feelings, for, with all due respect to the opinions and statements expressed in that manifesto, I think those who signed it have gone too far, and I regret that I can not altogether agree with them. At any rate, so far as infectious diseases are concerned, I must express my own strong conviction that in a large number of cases the judicious administration of alcohol is of the greatest service, and I have seen a considerable number of grave, and sometimes almost hopeless cases in which I have no hesitation in affirming that recovery was due to the use of alcoholic stimulants, not uncommonly in considerable quantities. Moreover, they are often of conspicuous value during convalescence. With ordinary prudence and care it is quite easy to avoid establishing a habit of taking stimulants in the case of patients who have been previously abstainers. While thus expressing my personal opinion in favor of the use of these agents in infectious diseases under suitable circumstances, I feel bound, on the other hand, to warn against their employment as a matter of routine, and venture to urge that the most thoughtful and conscientious consideration should be given to every individual case before ordering them.

3. *External and Local Treatment.*—"The treatment of external or local manifestations of particular infectious dseases, such as scarlatina, smallpox, or diphtheria, affords legitimate ground for differences of opinion, and I must confess it is often puzzling to determine what is best to be done for such conditions when one reads the different methods of treatment advocated by different experienced authorities. I can not refer to them further now, and must content myself with saying that the measures to be adopted must be determined very much by the particular views of the practitioner, guided by judgment and discretion, and modified by the special circumstances of each case. Antiseptics and disinfectants are employed with great advantage as local applications for various purposes. How far the light treatment, the X-rays, or particular color rays are going to help us, can not be definitely determined at the present time. Just now the subject has come very prominently before the profession and the public, and the 'red-light treatment of smallpox,' which, however, is by no means a novelty, so strongly advocated by Professor Finsen in the British Medical Journal for June 6, is attracting special attention, as well as some adverse criticism. What we may expect, also, from that wonderful, newly discovered element—radium—it is impossible to foretell, but we must be on our guard against accepting statements as to its marvelous curative effects by irresponsible observers.

4. *Vaccines: Serumtherapy.*—"What would, no doubt, be generally regarded as the most vitally interesting and important question of modern times, bearing upon the prevention and treatment of the entire group of infective diseases, is that of 'serumtherapy,' using the term as an inclusive one, which has come as the natural outcome of the microbic theory, and is founded, on the whole, on reliable bacteriological researches and experiments, supported by the results of practical experience in living subjects. Time will only permit me on the present occasion to touch the fringe of this most attractive and fascinating subject, and I will only ask you to bear with me while I remind you for a moment of what this method of treatment consists, and what are its objects and aims. Following Sims Woodhead's classification, the materials used are divided into—(1) Vaccines, which are either cultivations containing pathogenetic micro-organisms with toxins, or toxins only; or the tissues or fluids of an animal suffering from a particular infectious disease. (2) Antisera, which may be antitoxic only, neutralizing the toxins; antibacterial or antimicrobic, acting directly upon the organisms; or in some instances having both actions. The comparatively recent investigations of Professor Macfadyen and Mr. Sydney Rowland with regard to the immunizing power of the cell plasma of the typhoid bacillus, and the effects of repeated injections of this substance in rendering the blood serum of an animal both antitoxic and bactericidal, are very remarkable, and promise great results in the future. Up to the present time these therapeutic agents have been practically only employed by inoculation, being usually injected subcutaneously, but exceptionally more deeply, or into special structures. I note, however, that the antidiphtheritic serum has lately been recommended to be administered by enema, or even in pastils. Vaccines and antisera are employed either for the purpose of producing temporary or permanent immunity against an individual disease; or for the actual treatment of certain complaints or morbid conditions, either acting as definite 'cures,' or so modifying their course that their severity and dangers are materially lessened, their progress is hastened, and their mortality greatly diminished. The large majority of these agents are specific, being only used in relation to a particular disease; but the antistreptococcus serum has been found of service in various affections, and so-called 'Coley's fluid' is also non-specific. The diseases thus treated with which we are most familiar are smallpox, as prevented or modified by vaccination and revaccination, hydrophobia, diphtheria, tetanus, enteric fever, scarlatina, cholera, pneumonia, septicemia, anthrax and glanders, plague, tuberculosis, leprosy, and cancerous or sarcomatous growths, assuming them to be infective. Now, no one who has watched the course of events during recent years, and who is unprejudiced, can doubt for a moment or fail to acknowledge the immense value of this modern therapeutic method in relation to some of these complaints; there are others, however, in which thus far it has entirely failed in its objects; while in others still it is on its trial, and those who are in a position to speak authoritatively differ widely in their views and conclusions as to its efficacy in some of the most important infectious diseases. Personally I confess that I am inclined to regard not a few of the positive statements made with a skeptical mind, and I think we ought to be particularly careful in accepting and acting upon them at the present time, remembering the suspicious and not too friendly attitude of a large number of the influential laity toward the medical profession. At the same time, it can not be too strongly insisted upon that every member of the medical profession ought to avail himself or herself to the full of any method of treatment which bacteriology offers us, provided it has been scientifically and practically proved and demonstrated to deserve our confidence. It is not for us, in the present

state of the law, to deal with the 'conscientious objector,' but I emphatically affirm that any individual practitioner who wilfully and with intent neglects or is in actual antagonism to vaccination and revaccination as a protection against smallpox, may be justly regarded as guilty of a grave dereliction of duty, and is responsible for serious mischief, the results of which are but too evident to any unprejudiced observer. The same remark certainly applies to the neglect of the vaccine or antitoxin treatment for diphtheria, hydrophobia, tetanus, and anthrax. The opening of the new building of the Jenner (now the Lister) Institute of Preventive Medicine encourages the hope that this country will not in the future be behind others in advancing this most important and promising branch of scientific and practical medicine.

"It was my original intention to offer some observations on the prevention of infectious diseases from a general standpoint, but I have already trespassed too long upon your patience, and must content myself with a few closing remarks. I venture to affirm that the predominant aim of the medical profession as a whole is essentially beneficent. In support of which statement I can confidently draw attention to the deep interest exhibited by its members in this question, and to the efforts made by them, not only to limit and prevent these complaints in a general way, but to eradicate and exterminate those with which we may be thus able to cope effectually. This is no sham or pretence on our part, but an honest and straightforward policy and purpose, to which not a few devote their lives and best efforts, which ought to be a rebuke to scoffers and slanderers, of whom there are many. I will go further, and say that in dealing with infectious diseases, medical practitioners and scientific workers often exhibit a brave, courageous, and self-sacrificing spirit, which is worthy of our highest esteem and admiration. To go into the midst of a virulent epidemic, and fight against it day and night, often under the most trying and adverse conditions, which is no uncommon experience, is no trifling matter; and I could give many instances of individual courage and devotion, as well as of voluntary exposure to grave personal danger, sometimes ending fatally, which were truly heroic. Even the bacteriological researches in laboratories, which are intended to benefit humanity, are a source of danger—witness the cases of fatal infection with tuberculosis, and the death of the young Austrian doctor who not long ago succumbed from plague while working in Berlin. But I feel bound to pay a special tribute of respect and admiration to those who have gone forth to pestilential climates, and often under great hardships, or even by submitting themselves to dangerous personal experiments, have done such marvelous work in diminishing and controlling, or in some districts even exterminating, malarial and other diseases which were formerly the cause of destruction of human life on a vast scale, as well as of such extensive and profound deterioration of health.

"What will be the future progress of events in relation to the prevention of infectious diseases it is impossible to foretell or estimate, though the forecast is in certain directions decidedly hopeful. I venture, however, to submit that we as a profession should be extremely cautious as to what we say, and should avoid a too 'cheery optimism,' in the way of making promises and predictions which, recognizing the very nature of things, the conditions under which humanity exists, and the difficulties which so-called civilization brings with it—experience and common-sense must tell us are, to say the least, extremely rash. On the other hand, let us never relax in our efforts to promote the good cause, and to encourage, develop, and enforce every measure, scientific or practical, which has for its object the mitigation or prevention of those widespread and often terrible infectious diseases which now add so enormously to the death-rate, and which, even in cases of recovery, leave such serious after-consequences amongst large numbers of the community. And this we must do in spite of opposition, however powerful, persistent calumny, vicious attacks on our motives, or even being called foul names. There are numerous 'antis' about just now, but for downright insolence and impudence the antivivisectionists 'hold the field.' They have the most astounding faculty and capacity for fabricating statements for which there is absolutely no foundation, for distorting facts, and for cooking statistics, and they stick at nothing. Let us treat them and their hysterical outbursts with the contempt they deserve. Our duty is plain enough. Not only must we work on steadily as a profession in the direction I have indicated, but we must earnestly strive to gain the confidence and cooperation of influential individuals and communities, and to guide them on intelligent and rational lines.

"I have been asked to speak in this address in support of the appointment of a Minister of Public Health. I note that you, Mr. President, are not in favor of such an appointment; but personally I really do not feel competent to speak one way or the other. You have sketched a scheme with regard to the practical and official working of the Public Health Department which appears to have sound principles underlying it; and at any rate some change is obviously necessary. In the meantime, however, we must do what we can to educate and influence borough and county councils, and other public bodies which are concerned with sanitary matters, as well as members of both Houses of Parliament and to stimulate them to do their duty. Thus will we, as members of a self-sacrificing and noble calling, while endeavoring in our individual capacity to perform conscientiously and intelligently the duties which devolve upon us in relation to actual cases of infectious diseases which come before us in our several spheres of practice, be further collectively and with concerted action doing what lies in our power to promote the health and well-being of our fellow creatures on a large and comprehensive scale, and to avert or mitigate the effects of those grave maladies which are now such a scourge to humanity."

**Evolution of Abdominal Surgery.**—Dr. A. W. Mayo Robson, of London, gave the address in Surgery, basing his remarks on his observations extending over a third of a century and his experience in 2,000 operations. He said:

"It is clearly impossible in a short time even to briefly record all the advances made in surgery, but in my work as a general surgeon I have also had the privilege of taking part in the development and progress of a special branch, abdominal surgery, than which nothing could better exemplify the great changes that have occurred during the thirty-three years which I am considering; for, in the early Seventies, abdominal diseases were practically always treated expectantly, and if we look at the reports of 1870 we shall see that, as judged by results, it was perhaps just as well that surgery had then no business inside the abdomen.

"As knowledge increased, and surgery became more scientific, many of the diseases in question became surgical either from the beginning or at a later period in their course, so that to-day abdominal surgery is a subject of the first importance. Not only has treatment advanced by leaps and bounds, but our knowledge of abdominal diseases and their successful diagnosis has

enormously increased, partly by pathological advancement generally and by experimental research, but also by philosophical observations on the operating table and the study of disease in the living subject—in other words through biopsy instead of necropsy. The time was when the physician thought he had done all that was necessary when he had arrived at a probable diagnosis, and he philosophically waited until his hypotheses were proved or disproved in the deadhouse; treatment was left to the junior as being quite a secondary matter, and I am bound to say that in abdominal diseases that were not merely functional, and that could not be treated in the out-patient department, the estimate placed on treatment was often correct.

"Then ovarian disease was generally known as a form of dropsy, and was either treated by tapping, when the pressure became so severe as to demand some relief, or seeing that tapping was at times fatal or only gave a temporary respite, the greater number of cases went untreated. The surgery of the intestines, except for strangulated hernia, was not thought of, and uterine, renal, gall-bladder, stomach, liver, and pancreatic surgery were hardly dreamt of as possible. In 1870 an attempt was being made in some of the general hospitals to emulate the example set by certain pioneers, such as Clay, of Manchester, Spencer Wells, of London, and Keith, of Edinburgh, but with what result? It is interesting to note the following facts:

"In St. Bartholomew's in 1870 there were 3 ovariotomies, all fatal, and 20 cases of herniotomy in which the sac was opened, with 9 deaths. In Guy's there were 5 ovariotomies with 3 deaths, and 19 herniotomies with opening of the sac, of which 11 died. In St. Thomas's there was 1 ovariotomy, which died, and there were 14 herniotomies, of which 8 died. In St. George's there were 2 ovariotomies, both of which died, 1 colotomy, which died, and 20 herniotomies, of which 8 died.

"In the same reports there was always found a special record of the number of cases which are now so rarely seen. For instance, in one of the reports for 1870 there were recorded 53 cases of erysipelas, 20 of phagedena, 93 of diffuse cellulitis, and 4 cases of secondary hemorrhage after operation, which at the present time would be sufficient to condemn any surgical clinic; yet this record was no exception, as all the hospitals furnished similar reports.

"It would be invidious to compare the work of the various hospitals, as shown by the reports of 1902 published this year, but in one of the chief hospitals I notice a record of 40 ovariotomies with 39 recoveries, of 18 hysterectomies with 17 recoveries, of 241 herniotomies including strangulated hernia as well as radical cure of the hernia, with 233 recoveries, of 16 gall-bladder operations with 15 recoveries, a record of which no hospital in the world need feel ashamed.

"The rise and progress of abdominal surgery has centered more around ovariotomy than any other branch of work, hence it may be of interest to review for a moment the evolution of that operation, for it has been the battlefield of abdominal work.

"The history of ovariotomy is one of international importance, for the performance of the first operation has been claimed both by Great Britain and America. Williams, of Basle, in 1731 seems to have recognized the possibility of ovariotomy, and Hunter in 1762, with characteristic genius, actually suggested the modern operation, urging a small incision, the tapping of the cyst, removing it and ligaturing the pedicle. Houston, of Glasgow, operated for ovarian tumor before Mc D.well, but according to the best authorities McDowell, of Kentucky, performed the first complete and successful ovariotomy in December, 1809. Both in America and Great Britain the operation struggled into existence in the provinces before it engaged the attention of surgeons in the great medical centers, and in 1825 Liston boasted that Lizars (who had done several not very successful operations in Edinburgh) did not set about any such operations in the infirmary after he became attached to it. The medical papers of that day also condemned it absolutely.

"Although Clay, of Manchester, between 1842 and 1850 had chronicled 33 operations with 21 successes, a 36.3 per cent. mortality, and Spencer Wells in his work up to 1870 showed a mortality of 25 to 30 per cent., yet in that year, in the large general hospitals, the mortality was no less than 81 per cent. I distinctly recollect as a student the question being raised as to whether ovariotomy ought to be continued, and I remember as a dresser that the easiest cases, where there was a healthy peritoneum free from adhesions, were almost certain to die.

"From 1870 I followed keenly all the controversies on the subject, and a little later took the opportunity as a post-graduate of visiting Keith in Edinburgh, Spencer Wells in London, and some years later Lawson Tait in Birmingham, from all of whom I learned valuable lessons. Keith, a thorough believer in antiseptic procedures, in 1884 published a series of cases with a 9.11 per cent. mortality, but later he had 80 consecutive recoveries in completed cases, while Tait published an account of 405 cases with 33 deaths, an 8.1 per cent. mortality, and in 1885 he had had 139 cases without a death.

"The success in private practice and in the smaller hospitals was so much greater than in the general hospitals that the question was raised as to whether such operations ought ever to be performed in a general clinic. Yet what do we see to-day—last year there were 67 ovariotomies including malignant and suppurating cases performed in the Leeds General Infirmary (with which until recently I was actively associated) with only 3 deaths, otherwise a mortality of 4.4 per cent., which I find to be about the average in general hospitals; for although in private practice, where operations are performed at an earlier stage and in patients not worn down by suffering and hard work up to the last moment, better results may be shown, yet it may now generally be fairly stated to any patient suffering from ovarian cyst that her chances of recovery are fully 95 out of the 100, for excluding accidents such as syncope, embolism, and pneumonia, which are often unavoidable, there is no reason why any patient should die after an ordinary ovariotomy skilfully performed.

"It is interesting to note the changes that have brought about these results. I remember in the early Seventies, when there was no special preparation of ligatures, which were of silk used straight out to the storage cabinet, and often handed to the surgeon by the theater porter, who might even be post mortem attendant; when little care was spent on cleansing the surgeon's hands and none on cleaning the patient's skin; when a perfunctory washing was supposed to be sufficient for instruments, and a very superficial cleansing to be ample for sponges, which were doubtless the most fertile source of mischief. The surgeon then wore a non-washable operating coat to protect his own clothes from being soiled, and not, as now, a sterilized overall to guard his patient from contamination.

"The introduction of antiseptics started the change, but at first and for some years, carbolic acid was by many thought to act like a fetish, and to cover a multitude of sins; a mere dipping of the hands in a 1-in-20-to-40 solution was considered a means of cleansing, the soaking of catgut ligatures in carbolic oil was

thought to be a sufficient preparation, and the skin of the patient was for a long time ignored as a source of infection. Moreover, the improper use of the carbolic spray, which was allowed to play straight into the opened abdomen, was itself a source of danger, undoubtedly causing many deaths, though it was not dangerous when properly employed, as, for instance, by the late Thomas Keith, who, while using antiseptics, including the spray, yet took every care to cleanse his hands and instruments and the patient's skin; and in this way, so early as 1884, was able to record such good work. In the Eighties, following on the same lines, I was able to report my first series of 83 cases in a general hospital with 4 deaths, only two of which could be referred to as wound complications, though later I had a consecutive series of 103 cases in private, with only one death, and that patient was operated on when suffering from acute peritonitis.

"Then came a reaction against the use of antiseptics, and a veritable crusade, with much acrimonious writing, was led off by Lawson Tait, who argued that antiseptics were not only unnecessary to success, but were actually injurious. By Dr. Bantock, who held similar views, asepsis was carried out quite early; and I remember, when seeing him operate at the Samaritan Hospital, the infinite care he took in cleansing his hands and everything that came in contact with the wound; but in the late Lawson Tait's case his success came from another discovery, for, although he was by no means what we should now call an aseptic surgeon, as shown by his results in other than abdominal wounds, his genius found a different way, for he taught us the value of natural drainage through the intestines, and the importance of the avoidance of morphine. He made a routine practice of purging after operation, and so avoided that distention which used to kill so rapidly in early ovarian work. Had purging and the avoidance of morphine been adopted in the early Seventies I have no doubt that the large mortality of that day would have been materially lessened. Over and over again as a student I have seen patients killed by intestinal paralysis induced through morphine, who, I now know, might have been saved by a dose of calomel and Epsom salts. Other lessons I learnt from Lawson Tait were the value of rapidity in operating and of thoroughness in the removal of disease, for in early work on the uterine appendages it was not at all uncommon for the surgeon to be deterred by adhesions, and to rest satisfied with the drainage of pus tubes and cysts, instead of their complete removal, with the result that such patients either remained invalids or died more rapidly than if they had never been treated. I followed the evolution of the treatment of the ovarian pedicle by means of the external clamp (Wells), the cautery (T. Keith), the *écraseur* (Jessop), and lastly, by ligature with dropping of the pedicle, which we all now adopt, and which Baker Brown was the first to advocate.

"Under perfected technic, and a judicious combination of asepsis and antisepsis, ovariotomy has become one of the most successful major operations in surgery, and has paved the way for other equally great triumphs within the abdomen.

"The discovery of the frequency of perforative appendicitis, of perforating gastric ulcer, and of other peritoneal catastrophes is gradually abolishing the term acute peritonitis for the more rational one of acute peritoneal infection, for the treatment of which surgery alone is of any use, and even for it to be of service operation must not be long delayed.

"These more rational views of pathology and treatment have originated and developed with recent years, and I can recall case after case, during my student days, in which peritoneal catastrophes ended fatally, where now we should by timely interference give a very fair chance of life. Could anything show this more definitely than the results of treatment of perforated gastric ulcers, which if operated on at once would have hardly any mortality, if within 12 hours of rupture have a mortality of 16.6 per cent., if within 24 hours, 63.6 per cent., if within 36 hours, 87.5 per cent., and if delayed for 48 hours will only rarely succeed; or to give another example, than the results of surgical treatment of the intestine in typhoid fever, alas too seldom resorted to. To give an example kindly obtained for me by Dr. P. J. Cammidge: Out of a total number of 900 cases of typhoid fever occurring in St. Bartholomew's Hospital in the years 1895 to 1901 there were 102 deaths. Among the 900 cases were 38 of perforation, of which 34 died unoperated on, whereas of the 4 operated on 3 recovered. Could operation have been done in the remaining cases it would seem possible that 25 more lives might have been saved. In Professor Osler's clinic, out of 11 cases 5 were saved by operation. Intimately related to intestinal perforation is perforation of the gall-bladder in typhoid fever, of which 34 cases have been collected by Dr. Erdmann, of New York; of these 27 were not operated on and all died, but of the 7 which were operated on 4 recovered.

"As spontaneous recovery from perforation is extremely rare it is of the utmost importance that not only should we have an early recognition of the perforation, but also an immediate operation.

"Up to 1883 every case of intraperitoneal rupture of the bladder had died, but in that year the late Sir William MacCormac operated on and saved two lives; since that time there have been 54 operations recorded (according to Dr. Jones, Annals of Surgery, June, 1903), out of which 28 recovered, could these cases have been seen earlier, the saving of life would have been much greater, for in the cases that recovered there had only been an average interval of 25¼ hours between the accident and the operation, whereas in the cases that died the average interval had been 32 hours, and of the 26 deaths, 17 were due to peritoneal infection. Just as in gastric ulcer, the danger is increased with every hour of delay between the accident and operation; hence in case of doubt, exploration (which can be done through a very small incision, just sufficient to admit the finger) is safer than waiting, and experience shows that the aiding of the diagnosis by the injection of air or fluid into the bladder adds to the risk of general peritonitis by spreading infection over the whole abdomen.

"In injuries of the abdomen by penetrating wound, whether stab or bullet wounds, the resulting troubles are from infection, either directly through the instrument causing the injury or by perforation of one of the hollow viscera and escape into the peritoneal cavity of the septic contents; how much more rational it is to consider this as an infection and immediately to set about the removal of the poison and the repair of the damage, if it can be done under conditions favorable to success, than to treat it as peritonitis and rely on so-called antiphlogistic remedies. Few greater triumphs of scientific surgery can be shown than some of the remarkable cases of visceral injury, where stomach, bowel, liver, gall-bladder, and other viscera have been perforated, either by bullet or some other sharp instrument, and in which operation has been successfully performed, before infection has had time to occur.

"Appendicitis of the acute, perforating, or gangrenous type comes on so suddenly as often to constitute a peritoneal catastrophe, and in a proportion of cases terminates fatally in so rapid a manner that the diagnosis is made only with great difficulty, or not at all.

Such cases, when I was a student, went undiagnosed, and death was ascribed to peritonitis simply, a sufficient diagnosis in those days; and it was not till 1886 that we heard anything of this lethal malady, which though it has slain its tens of thousands is now, thanks mainly to the labors of Fitz, of Boston, who laid the foundation of our modern knowledge of the subject, brought under subjection in a very large percentage of cases.

"The disease is said to be on the increase, but I am not at all clear as to the truth of this, as there have been buried in our literary records for generations, fairly accurate accounts of dangerous inflammations occurring in the right iliac fossa and described vaguely as typhlitis, perityphlitis, paratyphlitis, etc., and both Copland and Burne in 1837 gave accurate descriptions of perforative appendicitis and its consequences.

**Hysterectomy for Myoma.**—"Although hysterectomy was unsuccessfully done by Heath in 1843, and successfully performed by Burnham in 1853, yet surgical progress was so slow that in 1883 a series of cases collected by Bigelow gave a mortality of 42 per cent., which was enough to condemn the operation, had it not been that Thomas Keith at that very time was doing brilliant work on the most serious cases, and establishing the operation on a sound basis. His mortality was 8 per cent., according to the late Greig Smith, who was himself operating with great success—barely a 5-per-cent. mortality. My own experience has been in 170 cases of operations for myoma, with a 5.2 per cent. mortality, this including all the earlier as well as the later operations, and including cases treated by the *serre-nocud* and by enucleation as well as by the more modern treatment of the pedicle and by panhysterectomy. The evolution of the operation of hysterectomy has been most interesting; just as the external treatment of the pedicle in ovariotomy gave the best results at first, so in hysterectomy the treatment by Koeberle's *serre-nocud* rendered the operation a justifiable one, and Dr. Bantock, Mr. Thornton, Lawson Tait, and others had considerable success by this means; but the difficulty of keeping the pedicle dry, the prolonged convalescence, and the subsequent liability to hernia led some surgeons to be discontented with it; yet I distinctly remember years ago when advocating the internal treatment of the pedicle at one of the societies, how some operators were very tardy to acknowledge the advantages of the operation introduced by Schroeder, and well on in the Nineties Greig Smith condemned it, stating that the mortality was double that of the extraperitoneal method. The latest statistics have been furnished by Mr. C. Bond, of Leicester, who recently reported 50 cases with 2 deaths—an excellent record.

**Biliary Surgery.**—"The surgery of the bile passages is one of the most interesting episodes in abdominal work, for although the first cholecystotomy was performed so far back as 1867 by Bobbs, of Indianapolis, it is only within recent years that surgery has come to be recognized as the treatment for gall-stones. I performed my first cholecystotomy in 1885, since which time I have operated nearly 600 times on the gall-bladder and bile ducts. When in 1889 I read a paper before the London Clinical Society, one of the leading London surgeons said to me, 'Wherever do you conjure your gall-bladder cases from; we never see them here?' I referred him to the medical wards and to the post-mortem room of any of the hospitals, with the result that within a short time he found many cases requiring relief. At first cholecystotomy only was practised, with the result that the ducts were often left obstructed and fistula necessarily followed. It was thought to be a bold venture when Lawson Tait crushed a stone in the common duct, a procedure which I followed with success on a number of occasions, until Courvoisier in 1891 showed it to be better to directly incise the common duct. Common-duct operations, as performed by the upward incision and rotation of the liver, which I introduced some time ago, are now as easy as an ordinary cholecystotomy used to be, for the improved method enables the whole of the biliary ducts to be brought near to the surface, and to be deliberately dealt with. Nothing could demonstrate this better than the results in my own practice in an experience of over 100 choledochotomies, for whereas in my first series before 1900 the rate of mortality was 23.8 per cent. in my last series it is only 1.5 per cent., and I have had a continuous series of 50 cases without a death; moreover, it must be borne in mind that nearly every one of these cases is not merely a successful operation but a life saved, for common-duct cholelithiasis associated with infective or suppurative cholangitis and deep jaundice is a mortal malady.

"Fortunately, gall-stones are usually easily diagnosed, the symptoms are classic and in the early stages before complications have supervened, cholithiasis is curable by surgical methods in 99 per cent. of cases, as I myself have demonstrated in a large series of operations; but if we wait for complications to supervene, and for the onset of jaundice and various infections, or until cancer has invaded the liver and gall-bladder, which it does ultimately in 50 per cent. of cases in which jaundice is present, then there will be a very different tale to tell.

"Even yet we do not get these cases always in time, and until the fact is grasped that medicine can, as a rule, only relieve and cannot cure cholithiasis we shall be continually having to operate in the presence of serious complications, endangering life, when operation is five to ten times more dangerous than if it had been undertaken at an earlier stage.

"The great reduction in mortality in gall-bladder surgery is due to an earlier diagnosis, a closer study of the pathogency of the disease, and infinitely greater care in operative technique. Much work remains to be done in this region, for it is a difficult and complex field, less accessible than many other regions of the abdomen, and often complicated by pancreatic trouble coexisting; but progress is steadily being made, and every year shows real advance tending towards perfection.

**Surgery of Liver.**—"The surgery of the liver was until recent years limited to the evacuation of abscesses and hydatids, and it is interesting to note the evolution of the various methods following closely one on the other; of emptying by trochar or aspirator; of opening by caustic or thermocautery; of incision *à deux temps;* and, lastly, of the method which we now generally adopt —hepatotomy, or direct incision of the organ after reaching the liver, either through the abdominal parietes, or, if necessary, through the thoracic wall—an operation the credit of which must be given to Lawson Tait, who published a first series of 10 cases between 1873 and 1882, all successful. Mr. Bryant, Mr. Knowsley Thornton, Mr. Godlee, myself, and others followed on the same lines. As showing the extent of this field of work I have operated directly on the liver for one disease or another nearly 100 times, this being exclusive of cases of jaundice dependent on gall-stones or pancreatic disease, for which I have operated on many more occasions.

"At first sight it would seem impracticable to remove a tumor of the liver but experience shows that although the liver tissue is friable and the capsule thin and not easily sutured, the bleeding is readily arrested by pressure, and it is possible to remove both simple and malignant tumors if localized and not too extensive.

Out of 9 operations for partial hepatectomy that I have performed, 8 have recovered, and in 2 cases where I removed a cancer of the gall-bladder and liver, the disease being proved microscopically, the patients are now in perfect health four years and three years respectively after operation.

"Dr. Keen, of Philadelphia, collected 20 cases of partial hepatectomy with only 2 deaths, and others have been performed since with equal success, so that the operation is one of real practical utility.

**Stomach Surgery.**—"The surgery of the stomach is still more recent than that of the gall-bladder, but unlike gall-bladder work, which was successful from the outset, the way to success in gastric operations has been paved with many failures, and only recently has the surgeon been able to show what can be done in this branch of the work. For instance, when gastrotomy was first performed by Sedillot and by those who followed him, it was nearly always fatal, the chief reason being that the patients were never handed over to the surgeon until nearly moribund; of such were my first 8 cases, of which 6 died; even up to 1890 the mortality was so great that the operation was seldom advised, yet it can now be done in so short a time and with so little disturbance that out of my last 24 cases all have recovered except 1, leading to considerable prolongation of life in the malignant and to saving of life in the simple cases. In the Seventies, any one with carcinoma of the stomach was at once given up as hopeless, and only in 1879 was the first attempt made by Péan to remove a malignant pylorus, the first successful operation being performed by Billroth in 1881, when the operation was looked on with as much disfavor as was the first attempted complete gastrectomy a few years ago by Connor in America, yet Schlatter's patient a little later lived fourteen months after complete gastrectomy, and I can point to a man in good health on whom I performed almost complete excision of the stomach two and a-half years ago, and to others now well who have had partial gastrectomy done. Professor Kocher's statistics in this branch of work are of great importance as showing that the radical operation may in some cases, if done thoroughly, prove curative.

**Gastric Ulcer.**—"Until quite recently gastric ulcer, except for one or two of its complications, has been considered to be a subject for medical treatment from first to last. The profession is, however, becoming awakened to the fact that it is not the trifling ailment it was once considered to be, and that it should from the first be taken seriously, for it is in the early stages that medical treatment can be employed to the best advantage, and in the later stages that general treatment is so often followed by relapse or by serious complications.

"Leube, one of the greatest medical authorities on the subject says that one-half or three-fourths of all cases will be cured by four or five weeks of treatment, but, if not better in that time, they will never be cured by medical treatment alone; and Einhorn says it is fatal directly and indirectly in 50 per cent. of cases when reliance is placed exclusively on medical treatment. It can be demonstrated that in the patients incurable by medical means surgery holds out a good hope of relief or cure in 95 per cent. of cases, as I have shown in an address recently given before the London Polyclinic. The subject is too large to enter minutely into, but from what I have stated now, and in other places have given in detail, it will be seen that in this as in other diseases of the stomach, modern surgery has very great triumphs to record.

**Pancreatitis.**—"The pancreas had practically received no attention from a surgical point of view up to Senn's classical experimental work in 1886, and even for some time after that the only interest centered around cysts, so that Greig Smith, writing in 1896, said, "The experience of the last ten years has added little to the work of Senn of Chicago." But what do we see to-day? That the subject is of such magnitude as to need a volume of considerable size to adequately deal with its pathology and surgical treatment. I myself have operated on nearly a hundred cases of diseases of the pancreas of various kinds. Acute pancreatitis is one of the most serious and fatal of diseases, often coming on with startling suddenness, and it is astonishing how it can have escaped the notice of pathologists until so recently. Fortunately surgery has been able to interfere beneficially in some of these cases, especially those ending in suppuration, and as our knowledge of the subject increases we shall be able to do more both in the way of prevention and cure. Chronic pancreatitis, though recognized from a pathological point of view, was practically unrecognized as a subject for surgical treatment until I drew attention in June, 1900, to the facts derived from an experience extending over some years, that many cases described as cancer of the head of the pancreas and leading to chronic jaundice, which ended fatally, were really cases of chronic pancreatitis that could be cured by draining the pancreatic duct indirectly through the bile passages; this has led to great success in the treatment of a class of cases previously treated as hopeless. The treatment of cysts is most successful, and it is now well established that in drainage we may reasonably expect to cure or materially relieve in a very large proportion (probably 93 to 95 per cent.) of cases.

**Tuberculous Disease.**—"The advances in the pathology and treatment of phthisis since the discovery of the tubercle bacillus have become public knowledge, but I do not think it is quite realized how enormous the saving of life has been; for, while in 1838, 38 persons in 10,000 died of phthisis, the proportion is now but 13 in 10,0000. Now can we show anything like this in surgical tuberculosis? I think we can, since preventive medicine of course applies equally here; and there can be no doubt that the early recognition of joint and bone disease has led to more rational therapeusis and a great saving of life and limb. To-day, however, I need only consider tuberculosis as it concerns the abdomen; and just as we saw that so-called acute peritonitis may be better described as an acute peritoneal infection, so, in the case of chronic tuberculous peritonitis, we should do better to term it tuberculous infection of the peritoneum, for it is generally a secondary infection; and frequently, as can be proved from actual cases, may be treated in an early stage by removal of the cause, whether that be a tuberculous appendix, a tuberculous pyosalpinx or ovary, a tuberculous mass of intestine or mesenteric glands.

"Although Spencer Wells some years previously, accidentally discovered that an extensive abdominal tuberculosis was cured by drainage of the peritoneum, it was not until 1884 that Koenig (*Centralblatt für Chirurgie*, 1884 and 1890) planned the operation which has had such good results, and has led to so many successes.

"What we must do in the future is to prevent these diseases if we can, by avoiding the distribution of tubercle bacilli in the air and in our food; or failing that, we must if possible catch cases at an earlier stage, and remove the primary focus, so as to prevent the general invasion of the peritoneum to which I have just referred. If, however, we are only consulted when the disease is so far advanced that medical treatment can do no more good, drainage of the abdomen by a simple and short operation may bring about recovery in a remark-

able manner, and I have seen patients reduced to the last extremity of weakness, where the mesentery was standing stiff with tubercle, and the abdomen was swollen to an enormous size, to recover completely and be thoroughly restored to perfect health from a condition apparently completely hopeless.

"**The Surgery of the Intestines** provides the most varied and difficult field of work in the abdomen, and as the ordinary methods adopted in general surgery here need modification, the evolution of intestinal surgery has been accompanied by infinite variety in detail.

"The interrupted suture at first employed occupied so much time in application that many modifications were soon introduced, and in 1885 Mr. Bishop showed there were no fewer than thirty-three distinct methods of enterorrhaphy, and since probably as many more have ben introduced.

"In 1887, Senn's plates were employed to facilitate the process of intestinal anastomosis, and I remember what a great impetus was given to the surgery of the intestinal canal by Dr. Senn's very able paper and demonstration at the International Medical Congress in Copenhagen. In 1892, being dissatisfied with the methods then in vogue, I invented a decalcified bone bobbin shaped like a cotton reel, which would form a temporary splint around which to apply two continuous sutures, one to the serous and another to the mucous margin of the new openings; which method has proved most useful, and I feel sure has ministered to whatever success I have had in this line of work.

"In 1892 Dr. Murphy, of Chicago, invented his well-known metal button, which, since it is employed without previous application of sutures, can be used very quickly, and by its distinguished inventor as well as in the hands of other surgeons it has been adopted with great success. The chief disadvantages it presents are (1) that it is necessarily associated with sloughing of the compressed and coapted ends of the bowel; (2) that a foreign body is left in the canal which sometimes produces ulceration and other troubles; and (3) that the opening has been found in some cases to contract and necessitate a further operation.

"It is astonishing what large portions of the intestinal tract may be taken away with safety; for instance, Mr. Barker removed 5½ ft. of damaged bowel with success in a case of strangulated gangrenous hernia, and I have on several occasions removed part of the ileum, the cecum, the ascending and part of the transverse colon with recovery of the patient.

"In the first number of the International Archives of Surgery is the description of a case in which Dr. Roswell Park removed 8 ft. 9 in. of gangrenous small intestine, the patient being well a year later; and in the same paper reference is made to 17 other cases in which over 6 ft. of bowel had been excised with recovery in 14; in one of these cases no less than 11 ft. were removed.

"In 1884 colotomy had the enormous mortality of 31.6 per cent. for the lumbar and 53.1 per cent. for the inguinal operation, as shown by Dr. W. R. Batt, who collected the records of 351 cases; in 1889, under improved technic, the inguinal operation was reintroduced by Mr. Allingham, with the result that the mortality was diminished in a short time to under 10 per cent., even including cases of acute obstruction, though excluding the acute cases the mortality is under 5 per cent. Looking to the future, it seems highly probable that colotomy will be largely replaced by the removal of the disease, for it has been clearly proved that there is no part of the lower bowel which cannot be safely excised if taken sufficiently early, and I can point to a number of patients living in comfort from whom I removed rectal cancer years ago; in one the patient being in good health ten years after. Mr. Watson Cheyne estimates the mortality of excision of the rectum at from 5 to 10 per cent., and refers to Kocher's statistics in which 28 per cent. of cases remained well from three to sixteen years after proctectomy.

"For the rational treatment of intestinal obstruction we owe much, first to the anatomical researches of Sir Frederick Treves, and secondly to his admirable work on the pathology and surgery of the subject.

"At the present day the differential diagnosis has been so well worked out, and the technic of operative work so much improved, that no physician or surgeon long delays resorting to operation if relief be not soon obtained, and the results as shown by numerous reports, amply justify the change.

**Hernia.**—"When I was a student much time was spent and great expense incurred both by patients and hospitals in the fitting of trusses to enable those crippled by rupture to go about with any degree of safety or comfort and many of those patients ultimately lost their lives through strangulated hernia, the operation for which at one time as shown by Mr. Barker, had the huge mortality of 53.1 per cent., and even yet, according to that surgeon, has in hospital practice the high rate of 22.2 per cent. My own experience does not bear out this high mortality, though I find it, as one would expect, to vary in hospitals and in private patients. Taking all my cases of strangulated hernia from 1880 to 1903, both in hospital and in private, the mortality has been 13.5 per cent., but while the private cases, for the most part operated on without loss of time, show only a mortality of 5 per cent. since 1890, the hospital cases seen at a later stage, show the all-round mortality of 14.2 per cent., and I thoroughly agree with Mr. Barker that cases seen when the bowel has become seriously changed will stand a much better chance of recovery if the damaged gut is removed by a free enterectomy of the proximal end.

"What we want, however, to impress on the public, is to have the radical cure performed early, when it is practically devoid of risk, as shown by the following statistics. In the Johns Hopkins Hospital there was only 1 death in 459 operations. In Carle's clinic in Rome, 2 deaths in 1,400 operations, in the Vienna clinic 3 in 804, and in Dr. W. B. Coley's 1,075 cases only 2 deaths, all of which when massed together give a mortality of about one-fifth per cent. But where the radical cure has not been done and strangulation unfortunately occurs, it ought to be more fully grasped that no time should be lost in taxis, but that operation should be performed without delay, when it can be done with a risk of not more than 5 per cent. and radical cure can at the same time be performed.

"**Ectopic Gestation** until recently constituted a dark chapter in medicine; it was altogether misunderstood both as to cause, pathology, symptoms, and treatment, and hundreds of lives were lost annually which are now saved by timely surgical intervention. To the genius of Lawson Tait, who utilized the post-mortem experience of Bernutz and Goupil published in 1886, and the clinical observations of J. S. Parry, we owe the successful treatment of this otherwise fatal disease. His work on this subject alone should be sufficient to establish a claim for him to be placed among the great benefactors of science and of humanity.

"As showing the success of his treatment from the first, up to 1887 he had operated 35 times for ruptured tubal pregnancy with only 2 deaths, and in my valedictory address at the termination of office as President of the British Gynecological Society in 1898 I was able to report, following on the same lines, 23 operations

for ectopic gestation with 1 death. The subject has received much attention at the hands of Professor J. W. Taylor, of Birmingham, Mr. Bland-Sutton, and others, but only recently has it been distinctly proved by 4 undoubted cases, 1 of which came under my care, that ovarian gestation is a possibility.

**The Surgery of the Kidneys and Ureters.**—"Although the dawn of renal surgery dates from August 2, 1869, when Simon of Heidelberg deliberately performed nephrectomy, the first successful operation in England was done by a member of your Council, my respected colleague, Mr. T. R. Jessop, an operation which I had the privilege of witnessing. Sir Thomas Smith advocated nephrotomy in 1869 before Simon's operation, but it was not until 1870 that Mr. Bryant first performed the operation and until 1880 that Mr. Henry Morris applied it to the removal of a calculus. As showing the advances that followed, the last named surgeon was in 1898 able to report 34 nephro-lithotomies with 33 recoveries, showing the invalidity of the objection which had before 1880 been urged against the proposal to operate on a kidney not already converted into a mere abscess sac; and proving that the conservation of the kidney by removal of the disease was infinitely better than the sacrifice of the organ, which was at one time advocated. The next advance was due to Hahn, who in 1881 described two cases in which he had performed the operation of nephropexy for the fixation of movable kidney, a procedure which in proper cases confers great benefit on a class of patients who previously had to bear their troubles until the movable organs were often converted into large fluid cysts owing to intermittent kinking of the ureters. By utilizing the partly stripped capsule and the posterior incision of Edebohls, I have been gratified with the results, both immediate and remote, of the operation, which with little or no risk, in properly selected cases, has been the means of restoring many invalids to a state of health and comfort.

"The most recent advance in renal surgery has been in the treatment of chronic nephritis of Bright's disease, which was first drawn attention to by my friend Mr. Reginald Harrison, who recommended the renal puncture or incision in certain cases of chronic albuminuria; but to Dr. Edebohls, of New York, must be given the credit of adopting an original operation for the treatment of Bright's disease. He in 1898 deliberately exposed both kidneys, stripped their capsule, and fixed them in position, in a young woman of twenty-six. Frequent examinations during the five years showed in every instance normal conditions, and the patient has recently married and is well. In March of this year Dr. Edebohls reported 51 cases of renal decapsulation, and in 47 of these cases both kidneys were operated on at the same time. Out of this large number, 22 are said to be improving from three to fifteen months after operation.

"As yet it is too early to pronounce a definite opinion on the procedure, but it is an undoubted fact that recapsulation does effect some improvement in this serious malady, and it may possibly prove effectual in saving life in those terrible cases where suppression of urine comes on after some trifling operation, such as catheterism, or after a chill, or in scarlatina; just as surgery has effectually stepped in and saved life where suppression was due to obstruction of both ureters. We may certainly go so far as to say that no patient ought to be allowed to die from suppression of urine without the surgical question being considered.

**Immunity.**—"In future it seems assured that many of those infections will be dealt with by the method of immunization; and it seems not at all improbable that, even if such diseases cannot be prevented, the necessity for operation may in some be staved off, while in others the operative results may be materially improved, and the postoperative anxieties lessened by protective inoculation before operation.

"Of the treatment of streptococcus infection, such as erysipelas and other diffuse inflammations, by the antistreptococcus serum we can probably all point to some excellent as well as to other uncertain results; but as improvement in the preparation of the antitoxin occurs, and as our knowledge of when and how to use it is increased, we shall be able to calculate on more certain results. At the present time surgeons are finding the injection of the serum of service in immunizing before operating in certain regions, such as the tongue, mouth, throat, and rectum, where asepsis cannot be secured with certainty.

"Dr. A. E. Wright's researches with regard to localized staphylococcus infection, as in boils, acne, and sycosis, have shown that in all these cases there is a defective power of phagocytosis with respect to the staphylococcus, as well as invasion by that organism. The inoculation of a staphylococcus vaccine has the effect in a considerable proportion of cases of immunizing the patient against the special organism, and in the Lancet for March 26, 1902, Dr. Wright has given his experience of the remarkable results he has obtained in these well-known and troublesome diseases of the skin and hair follicles.

"These researches on the localized cutaneous invasions of staphylococci have paved the way for further therapeutic applications in connection with wounds and open ulcers.

"It seems not improbable, in the early future, that in all inflammations, whether of the respiratory tracts or the pleura, of the brain or the meninges, of the uterus or its appendages, of the middle ear and its sinuses, of the abdomen and its contained viscera, as well as of the joints and bones, that the services of a skilled pathologist will be required, who will by a blood examination or otherwise determine the organism or organisms causing the infection, when the appropriate serum or vaccine will be immediately employed, so as to arrest the inflammatory process, or in case of the disease having advanced too far for arrest, to limit its extension, and by a process of immunization to prepare the patient for operation, should such be called for.

"Gentlemen, I have tried to show that the advances in treatment during the past third of a century have been commensurate with our increased knowledge of disease, and simply on account of time have I limited myself in a great measure to diseases of the abdominal cavity.

"I have tried to show what a close connection exists between the science and art of our profession, and how very necessary it is, if we are to continue our march of progress, that experimental research should not only be untrammeled by factions and unreasoning opposition, but that it should receive greater recognition, encouragement, and support at the hands of the public.

"I have tried to forecast the future, and to show that while surgery has still great strides to make and many difficulties to conquer, such progress will be in a great measure intimately bound up with the work of the physician, the pathologist, and the bacteriologist, and I think the time will come when preventive measures such as I have portrayed will save much operative work, and when it will be thought a greater triumph to prevent than to cure disease.

"We can see that methods and policies which were sufficient years ago are totally inadequate to-day. We may modify but we can not prevent the world's advance, and while times change men change with them. The

medical profession is imbued with a spirit that half a century ago was undreamed of. Not only have apparently unsurmountable difficulties been overcome, but habits of thought have been attained which have made such achievements possible, and a scientific attitude of mind has become characteristic of our profession, as it has of the leaders in every branch of the world's progress.

"In becoming more scientific, it is a mistake to suppose that the medical profession has lost touch with higher beliefs. As Lord Kelvin has so happily stated it lately, 'Science positively affirms creative power. We only know God in His works, but we are absolutely forced by science to believe with perfect confidence in a directive power, in an influence other than physical, or dynamical, or electrical force.' There is no harm in free thinking, for if we think strongly enough we are forced by science to the belief in a higher power, which is the foundation of all religion."

*(To be Continued.)*

## BOOK REVIEWS.

Transactions of the American Ophthalmological Society. Thirty-eighth Annual Meeting, New London, Conn. 1902. Vol. IX. Pt. 3. Hartford, Conn. Published by the Society.

It is but faint praise to state that these Transactions increase in value from year to year. The Society records here the loss of one of its most distinguished founders in the person of Dr. Henry D. Noyes, whose portrait is the frontispiece and whose well-written eulogy is the foreword of the book. Glaucoma is again carefully studied. Many cases of carcinoma are reported. A study of changes caused by injections of pure cultures of *Bacillus typhosus* into the anterior chamber of rabbits' eyes is carefully recorded. There is a study of the diffusion circle in correction of ametropia. Cases of tobacco amblyopia, methyl alcohol debauch and fatal cavernous sinus thrombosis from grip with its important treatment, are reported; also a careful study of "ossification of the choroid." Tests for color-vision are reconsidered. Finally a careful study is made of primary insertions of the ocular muscles. The whole is a volume of great value.

Uterine and Tubal Gestation. By Samuel Wyllis Bandler, M.D., Instructor in Gynecology, New York Post-Graduate Medical School. Wm. Wood & Co., New York.

This little volume is but an elaboration of articles on the same subjects published in The American Journal of Obstetrics and Gynecology.

In a way it is decidedly unique, in that it deals with the subjects almost entirely from the laboratory point of view, giving us the true scientific aspect of the conditions which occur in the tissues of the maternal generative organism during both tubal and uterine gestation. It is most unfortunate, however, that such a book will not prove to be of much service to the medical profession at large, as it is too technical and requires a too intimate knowledge of histology, embryology and pathology for the average practitioner to appreciate what the author has to say.

The third portion of the book is devoted to the histology of that most interesting condition known as chorio-epithelioma. The author suggests that the origin of the metastases may be explained by the fact that fetal cells are carried into the maternal circulation and are deposited here and there to become foci of proliferative cell agglomerations of the fetal type. But this does not seem satisfactory, for if such were the case we might with reason expect the metastases of liver, kidney or cells from any fetal organ to do the same thing.

Dr. Bandler's book deserves commendation from the thoroughness and clearness of its subject-matter and is undoubtedly a valuable treatise of its kind.

A Text-Book of Chemistry for Students of Medicine, Pharmacy, and Dentistry. By Edward Curtis Hill, M.D., Professor of Chemistry and Toxicology in the Denver and Gross College of Medicine, University of Denver. F. A. Davis Company, Philadelphia.

While a work of the more or less conventional type this volume of Dr. Hill's has much to commend it, particularly to students of pharmacy and of medicine.

The information is reliable, well arranged and well chosen; there are excellent chapters on drug incompatibility in prescriptions and on adulterations and sophistications in food—chapters that can not fail to be of immense interest to all students.

We find very little of the newer physical chemistry of Ostwald, Nernst and others, much of which might have been incorporated to advantage, but for practical purposes the book is in many senses admirably adapted for the needs of the students for whom it was prepared.

Diseases of the Heart and Arterial System. Designed to be a Practical Presentation for the Use of Students and Practitioners of Medicine. By Robert H. Babcock, A.M., M.D., Professor of Clinical Medicine and Diseases of the Chest, College of Physicians and Surgeons, Chicago. D. Appleton & Co., New York and London.

In many ways this is a remarkable book. It not only reflects great credit on the author for his grit in overcoming what to most men would have proved insuperable obstacles, but he has moreover given us almost the first good authoritative work on diseases of the heart and blood-vessels by an American author.

There are 853 pages of closely written text with over one hundred illustrations, most of which are admirable from both the pedagogic and artistic standpoints. The book-making is in accord with the publishers' well-recognized sterling quality.

In its general scope and mode of handling the work does not differ very widely from other well-recognized standards. Foreign and home authors are widely quoted, but nevertheless the work has a distinct individuality.

We feel that we can recognize in this work an entirely new note of a superior character, a refinement much above the average of the descriptions of sound phenomena that stamp it as unique. The signs gained by the organs of hearing are here given with a completeness and finesse that is not found elsewhere. The author's blindness has made the medical world profit thereby, for special analysis of sound phenomena has undoubtedly given him an acuity of this sense possessed by few others.

Another point of advantage is the plain practical and straightforward character of the author's descriptions and his lengthy consideration of the therapeutic side of the problems presented. Treatment is full and very satisfactory.

We commend to our readers this work of Babcock's as a very desirable work for both the specialist and the practitioner, and wish the author a most hearty welcome for his admirable literary endeavor.

# THE MEDICAL NEWS.

A WEEKLY JOURNAL OF MEDICAL SCIENCE.

VOL. 83. NEW YORK, SATURDAY, AUGUST 22, 1903. NO. 8.

## ORIGINAL ARTICLES.

### CARDIOPTOSIS.

BY ALBERT ABRAMS, A.M., M.D.,

OF SAN FRANCISCO.

THE downward falling of the heart, which this term implies, is a condition to which only inadvertent reference is made in medical literature, notwithstanding the fact that the personal observations of the writer show it to be more than a mere phenomenon. In this connection, congenital anomalies, such as transpositio cordis and ectopia cordis, the result of fissural malformation of the anterior thoracic and abdominal wall will be wholly disregarded. The recent literature on cardioptosis is practically limited to the observations of Rummo[1] and Ferrannini.[2] The former unfortunately includes under the designation, cardioptosis, luxations of the heart without specifically limiting the term to an essential ptosis of the heart. Ferrannini, while recognizing ptosis of the heart as an essential condition, associates it with anomalies in the form of the body. He contravenes the current assumption, that downward displacement of the heart is the result of mechanical influences which force it downward such as tumors, pleural effusions, etc. In his four reported cases, the cardiac dulness was of normal extent, but both the upper and lower borders were lower than normal and there was decided epigastric pulsation. In all, there was mitral stenosis. The patients showed abnormalities of growth and other signs of imperfect development of the skeleton and large vessels and he believes that cardioptosis was caused by congenital imperfections in the vascular system and by the mitral stenosis which he considers to have been congenital. The loss of elasticity in the vessel walls and the enlargement of the heart allowed of the dropping of the organ downward. My own observations refer to individuals in whom no cardiac anomaly was present beyond malposition of the organ and when murmurs were demonstrable, they were accidental. The cases referred to permit of the following etiological classification: (1) Voluntary cardioptosis; (2) cardioptosis associated with ptoses of the abdominal viscera; (3) cardioptosis of accommodation; (4) primary essential cardioptosis, with no other cause, beyond a supposititious one, of impaired tonicity of the large blood-vessels supporting the heart.

The situs of the heart is maintained by pulmonary suction. The lungs occupy all of the chest excluding the area occupied by the mediastana. To occupy the thoracic space, the lungs must undergo considerable stretching and this is made possible by the large amount of elastic fibers which enter into their histological composition. For this reason, the lungs show a constant tendency to contract and this inclination is augmented during inspiration but the atmospheric pressure within the lungs overcomes this tendency and as a consequence the lungs are kept in relatively close contact with the chest walls and the contiguous intrathoracic structures. The lungs thus exercise a negative pressure or suction on the structures referred to, which is called pulmonary suction. The presence of air or fluid in the pleural cavity of one side diminishes the pulmonary suction on that side and the greater suction of the unaffected side will cause the heart to be drawn to the latter side. Displacement of the diaphragm is a late phenomenon of gas or fluid in the pleural cavity and only occurs in the presence of large accumulations of fluid or gas. Another factor which influences the situs of the viscus is the position of the diaphragm to the central tendon of which the pericardium is attached. Every descent of the central tendon of the diaphragm means a downward movement of the heart. Physiologists have taught that the central tendon is capable of only limited movement and Campbell[3], asserts, that, when the pulsating heart is felt in the epigastrium after deep inspiration, it is not due to an actual descent of the heart but to a lifting upward of the thoracic cage over that organ. The Roentgen rays, however, have despoiled the physiologist of many accepted facts. The rays show that the heart descends during inspiration and ascends during expiration. During the former phase of respiration, the silhouette of the heart becomes more defined, the transverse diameter diminishes and the heart inclines slightly towards the right. During inspiration, the cardiac pulsations show less amplitude than in expiration, a fact which may be referred to the stretching of the pericardium during inspiration. During expiration, the heart rests on the diaphragm with its long axis at an angle with the median line of the body but with each inspiration, the heart becomes more vertical with the long axis less inclined toward the horizontal. Measurements of the transverse diameter of the heart show it to be less during inspiration than during expiration. During deep inspiration, a clearly defined space may be seen between the heart and the diaphragm for in this phase of respiration, the heart is supported by the blood-vessels and does not rest on the diaphragm.

*Etiology.*—There are other factors beyond those mentioned in my etiological classification which induce cardioptosis. Some of these factors are: (1) Increased size and weight of the heart; (2) aneurisms and new growths which displace the heart downward; (3) adhesions, pleural or pericardial. None of these factors,

however, were concerned in the cases which have come under my observation.

*Voluntary Cardioptosis.*—The most pronounced case of this kind which ever came under my observation[4] was that of an individual who could produce voluntary dislocation of the heart, stomach and kidney. He had developed phenomenal control of his diaphragm. With the gastrodiaphane, one could observe with what ease the individual in question could shift his stomach about. He could dislocate his stomach downward to a point on a level with the crests of the ilia and then by a supreme effort, he could draw his stomach upward until it could no longer be seen. He could develop a phantom tumor at will by buccal insufflation of the stomach, relaxation of the recti muscles, forcible contraction of the diaphragm and forward arching of the vertebral column. His apex beat, which was felt in the fifth, could be made to descend to the seventh intercostal space and it was maintained in the latter situation until his control of the diaphragm was relinquished.

*Cardioptosis, a Participating Condition in Splanchnoptosis.*—Cardioptosis, associated with Glénard's disease, is, in my experience, rarely associated with symptoms referable to the heart beyond the objective sign of misplacement of the organ. The position of the diaphragm, and with it the heart, is greatly influenced by intra-abdominal tension. In its passive state, the diaphragm lies high owing to the negative pressure on its upper and the positive pressure on its under surface. Two factors enter into play in maintaining intra-abdominal tension, viz.: pressure of the atmosphere on the yielding abdominal parietes and contraction of the abdominal muscles. Intra-abdominal tension varies from hour to hour and is much increased by augmented intragastric and intestinal pressure. I have already shown[5] the influence of a dilated stomach and distended colon on the position of the heart by artificial insufflation of the stomach and colon while the Roentgen rays were traversing the chest. The tonicity of the abdominal muscles is an essential factor in maintaining the normal position of the underlying viscera. Flaccid abdominal walls diminish intra-abdominal tension and conduce to ptosis of the abdominal organs, descent of the diaphragm and prolapse of the heart.

*Cardioptosis of Accommodation.*—We have long recognized the almost intelligent function of muscles whether displayed in fixing a diseased joint or spine, or in protecting an inflamed serous membrane. Now the midriff will become fixed in the deepest inspiration when, if for any reason, there is any encroachment on the respiratory area in the upper thorax. With this descent of the diaphragm, there is also a downward luxation of the heart which I have referred to elsewhere[6] as the dislocation of accommodation, it being a mere act of compensation on the part of Nature to augment the area of respiration which has been compromised by the presence of an aneurism or tumor. It is usually taught that descent of the heart in aneurism and in an intrathoracic neoplasm is purely of mechanical genesis but cardioptosis occurring early in these conditions, at a time when the mechanical element can be of no consequence suggests descent of the diaphragm as the only plausible explanation. In old age, the accommodation of dislocation is commonly present and the low position of the diaphragm and heart is a mere accommodation phenomenon to compensate for the increased length of the aorta. If we make firm compression of the upper thorax of a child one may note the immediate descent of the heart. I have observed dislocation of accommodation in thoracic aneurism if the latter is unaccompanied by aortitis.

In health during deep inspiration, there is usually a free space between the heart and diaphragm, and the heart does not rest on the latter but is supported by the blood-vessels. In aortitis and aneurism associated with anginous signs, the diaphragm lies high, as if to support the heart and diminish traction on the blood-vessels. This intelligent display of muscle instinct which is in part voluntary causes the heart to lie high if in aneurism pain predominates and to lie low, if dyspnea is the predominant symptom.

*Primary Essential Cardioptosis.*—The majority of cases observed by the writer belong to this category. There was no associated condition present to account for the cardiac ptosis beyond a relaxation of the arterial system and the writer is constrained to refer its genesis to a hypotonicity of the large blood-vessels which support the heart. Vascular hypoplasia is an almost constant condition in chlorisis and is often encountered in other conditions, notably in persons of tuberculous habit. There is no reason to believe that this congenital defect of development is ever wholly corrected and it may persist throughout life. Associated with this hypoplasia is a pronounced elasticity of the blood-vessels so that the aorta may be stretched like a rubber band. The pathologist often has an opportunity to observe the elasticity or non-elasticity of the arteries at a necropsy. Atheromatous arteries appear long after removal from the body because they are no longer endowed with elasticity, whereas elastic arteries appear shorter owing to their retractility. In three of my cases only could I make out a distinct history of chlorosis although at the time of my examination, hemanalysis demonstrated nothing characteristic of that affection.

*Symptomatology.*—Here reference will only be made to the cases of primary essential cardioptosis which have come under my observation. The signs are subjective and objective. The tableau of subjective symptoms is by no means characteristic. Very often cardioptosis may be present without subjective symptoms and the condition is only observed accidentally. In other instances a feeling of weight or oppression is experienced in the lower chest which is referred by the patient to the lower sternal region or epigastrium. This symptom is associated with epigastric pulsation and dyspnea. The dyspnea is very

much intensified by exertion. One of my patients, a physician, tells me that when he is compelled to lean forward to examine a patient in bed, his dyspnea becomes so pronounced that he cannot continue his examination. Even as a child, he noticed this dyspnea upon exertion, but of late years the dyspnea has become so intensified that he is almost compelled to give up the practice of his profession. Some patients show a preference for certain postures in bed but this manifestation is too inconstant to be of any value in diagnosis. Objectively, percussion is too indefinite to permit of accurate delimitation of the cardiac boundaries: the upper border of cardiac dulness, superficial and deep will be found to be lower than normal. The apex beat is with difficulty palpated and in lieu of the punctated beat a diffuse one is felt. Auscultation may or may not elicit cardiac murmurs and if present, they are greatly influenced by posture—a certain posture will bring them in evidence, whereas another posture will cause their evanescence. The murmurs are probably accidental and dependent on the malposition of the heart.

The pulse suggests diminished tension of the arterial wall: it is soft, readily compressible and its dicrotic character is clearly brought out in the sphygmogram.

The pathognomonic signs of cardioptosis are elicited by skiascopy. No description nor diagram can adequately describe the characteristic picture of cardioptosis. This can only be appreciated after a thorough acquaintance with the normal heart and its respiratory and postural mobility. The normal heart during deep inspiration is practically vertical and between the heart and the diaphragm there is usually a well-defined space. During expiration the long axis of the heart describes an angle with the median line of the body but this is not appreciable; to the tyro it appears as if the heart were sunk more deeply into the diaphragm; the upper part of the viscus still maintaining its vertical position.

In cardioptosis, the long axis of the heart appears to be practically parallel with the surface of the diaphragm; the boundaries are poorly defined and deep inspiration does not bring into evidence the clearly defined space between the heart and the diaphragm. This posture of the heart could be assumed if the midriff were abnormally high as in abdominal distention, yet, if the long axis of the heart were measured, it would be found by describing the distance of the axis on the chest wall, that it would extend higher in the thorax than would a normal heart. The highest anatomic point of the heart is represented by the left auricle which is at the lower border of the sternal insertion of the second rib, its lowest point is at the upper border of the sixth costal cartilage or in the fifth intercostal space just within the mammary line. Measurement of the long axis of the heart in cardioptosis would show that the heart lies lower than normal. The site of the normal heart is influenced by respiration and attitude. In cardioptosis there is little or no respiratory or attitudinal dislocation. Reference has already been made to the changes assumed by the heart during respiration. My measurements of attitudinal dislocation show that in the left lateral posture, the heart moves on an average of 2.6 to the left and 1.1 cm. upward; in the right lateral posture, 1.5 cm. to the right and 0.5 cm. upward. As a rule, attitudinal dislocation was less evident in children than in adults and less marked in obese individuals than in lean ones.

*Treatment.*—This can be dismissed in a word. I have found nothing of avail in the treatment of my cases beyond the wearing of good fitting abdominal support with pressure exerted in the upper abdomen. In cardioptosis associated with Glénard's disease, exercises having for their object strengthening of the abdominal muscles and the diaphragm often yield excellent results coupled with massage, faradization and hydrotherapeutic procedures. I have seen no results from medication, although digitalis would seem to be theoretically advisable in cardioptosis of the primary essential variety.

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## MANAGEMENT OF BREECH PRESENTATIONS.

BY E. M. THOMAS, M.D.,
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IN the management of breech presentations the attitude of the accoucheur during delivery, so long as there is no immediate danger to the child or mother, should be one of watchful observation. As a rule, the results to the child are unquestionably more favorable if nature does her work unaided, but should there be any faltering in the natural forces the physician should be in readiness to avert by prompt interference the perils which, in pelvic presentations, are associated with delay.

Pains should be taken to preserve the membranes until dilatation is complete, therefore, unnecessary examinations should be avoided: the patient should be placed upon her side and cautioned not to strain, and after the rupture of the membranes, it is best for the expulsion of the trunk to take place slowly, but when the hips appear at the vulva, the attending physician should be ready to extract at once in case of emergency. The patient should be placed across the bed with hips well over the edge of the bed, and she should be instructed to bear down with the pains.

The question of anesthesia is not always easy to decide. It is very useful in unruly patients, but it sometimes lessens the pains, and besides, you lose the very beneficial cooperation of an intelligent patient, which is a drawback to its use. The rectum and bladder should both be emptied. The operator should have at hand in case of need,

forceps, a soft fillet, warm napkins, hot and cold water.

The operation is divisible into three acts: (1) Extraction of the trunk as far as the shoulder; (2) extraction of the arms and shoulders; (3) extraction of the head.

The extraction of the trunk should take place slowly, and tractions should be made during the pains only, and it is desirable that the uterus be closely retracted upon the child during the entire period of its expulsion. When this does not occur the arms are liable to be pushed upward to the sides of the child's head, the chin to become extended, and the delivery of the head would become very difficult; hemorrhage, too, is more likely to follow hasty delivery than where the uterus has had time to pass into a state of complete retraction; therefore firm pressure should be made upon the uterus through the abdominal walls, so as to maintain firm contraction upon the head of the fetus. Traction should be made downward and backward in the direction of the superior strait, until the breech comes in contact with the floor of the pelvis.

When the breech alone presents, with both extremities reflected upward parallel to the anterior surface of the child, spontaneous delivery is sometimes prevented by the fact that the extended limbs act as splints which interfere with the lateral fluxion of the trunk, and, consequently, with its accommodations to the curve of the parturient canal. If in pure breech presentations obstetrical aid becomes necessary, the operator is embarrassed by the absence of a natural handle, by means of which extraction can be effected; but, if the child is of ordinary size and the resistance at the pelvic floor is not too great, the expulsion of the child may sometimes be effected by graduated pressure upon the fundus of the uterus. Should this measure fail, manual extraction should be attempted. The index finger should be inserted into the fold of the anterior groin, and traction made directly downward. If the breech is low, both index fingers may be used, one in each groin, but should manual extraction fail (which is very likely to happen, especially in primipara), then instrumental aid becomes necessary. The choice consists of the forceps, the fillet, the blunt hook, and, when the child is dead, the cephalotribe in the order given.

But the forceps, being designed to fit the fetal head, when applied to the breech to which its curves are not adapted, is liable to slip off when traction is made, thus endangering the maternal soft parts and if, with the view to prevent slipping, the handles are compressed firmly, it has been urged that fracture of the femur may occur, or that the circulation of the cord may be cut off by the pressure, or that fatal injuries may be inflicted upon the fetus by the pressure of the points of the forceps upon the abdominal viscera, but with the axis traction forceps of Tarnier, some of the objections have been very materially diminished. The forceps should never be used until the child has passed the superior strait, and some authors advise, not until it is well down upon the floor of the pelvis, and in the use of the forceps there should be no exhibition of strength. The tractions are most effective if made during the pains, and gradual and intermittent tractions will soften and dilate the material soft parts better than continual hard pulling. They should be aided by simultaneous pressure upon the fundus of the uterus.

If the forceps fail, or if, owing to the non-engagement of the breech, they are contra-indicated and an extremity cannot be brought down without the employment of force, the next best thing is the fillet. The objections urged to its use are that the fillet might become twisted or, in getting wet, it might form an uneven band, which, even with care, might cut into the tissues of the child, or that in some cases it causes partial extension of the extremities, and as a consequence might slip forward upon the thigh and, in making traction, cause fracture of the thigh bone.

But Ollivier suggests that this extension can be prevented by passing the finger into the rectum of the mother and pressing the breech forward as tractions are made.

The fillet should be passed over the anterior thigh, the tractions should be of moderate force and should be made only during the pains, and should be sustained by external pressure over the fundus uteri. The fillet can be made of any strong material, but caution should be used in preventing folds, as they are apt to cut into the soft tissues of the child. In the absence of other appliances, or should failure attend the measures already described it is well to remember that the blunt hook owes its sinister reputation not so much to its defects as to proper caution in its use, it will not break the femur if adjusted in the groin; it will not produce serious contusions if the blunt end is carefully guarded by the fingers, and injuries to the maternal tissues can only occur where leverage movements are made. Steady downward tractions made with moderate force, with a hand in the vagina to guard the point of the instrument and to give warning of commencing extension of the thigh, will, as a rule, suffice to prevent accident.

No instrument will seize the breech so securely as the cephalotribe. If, therefore, the child is known to be dead, the cephalotribe screwed tightly to the breech can be trusted to act as a reliable tractor.

*Management of the Cord.*—As soon as the cord has passed out of the vagina, traction upon the navel should be avoided, by gently pulling the cord downward into one of the recesses until some resistance is experienced. Sometimes the cord is found passed between the child's legs and up over its back, in which case traction should be made upon the placental extremity, and an attempt made to slip the loop over the posterior thigh. But if this fails, and the cord is wound around the child's body, two ligatures should be applied and the cord divided between, and every

effort be made to deliver the child as speedily as possible.

*Liberation of the Arms.*—After providing for the safety of the cord, the pelvis of the child should be seized with both hands and traction made in a downward direction until the shoulder blades make their appearance. Then no time should be lost in liberating the arms. If they are folded upon the chest, delivery is an easy matter, but unless the uterus has been kept well contracted down upon the child's head, one or both arms are apt to be extended upward to the sides of the child's head. In such cases the difficulties in liberating the arms are often very great, owing to the increased amount of space afforded by the curvature of the sacrum an attempt should first be made to release the posterior arm. This is best accomplished by drawing the body of the child upward and to the side, causing the posterior shoulder to sink deeper into the pelvis and furnishing more room for the introduction of the hand. Then two fingers should be passed along the side of the child to the elbow-joint, which should be pushed across the face, and brought down over the thorax. Pressure should always be made at the elbow-joint and not upon the humerus, otherwise a fracture of the humerus is liable to occur, in releasing the anterior arm, as there is rarely space enough between the symphysis and the shoulder to allow the fingers to reach the elbow. It is customary, after releasing the posterior arm, to rotate the trunk, so as to bring the anterior arm backward into the cavity of the sacrum. This is accomplished by drawing the liberated arm upward under the symphysis pubis. If the back is turned to the left, the arm should be drawn upward along the left labia, and if turned to the right it should be turned along the right labia. In making artificial rotation, it is well to bear in mind the warning of Dr. Barnes, that the atlas forms with the axis a rotatory joint, so constructed that if the head be rotated beyond a quarter of a circle, the articulating surfaces will part, and the spinal cord is compressed or torn. Therefore, in making rotation be sure that the head is rotating with the body. It is well to mention here that the body is always to be kept wrapped in warm napkins until complete expulsion of the child.

*Extraction of the Head.*—In the extraction of the head we have to distinguish, first, cases where the head has entered the pelvis and has only to overcome the resistance of the perineum; second, cases where the head is retained at the pelvic brim by contracted pelvis, stricture of the os uteri, extension of the chin, or insufficient expulsive action of the uterus and abdominal muscles.

*Extraction of the Head After it has Entered the Pelvis.*—In Smellie's method the child is wrapped in warm napkins and placed astride the operators arm, the index and middle fingers are passed into the vagina and placed in the canine fossæ, to the sides of the child's nose. By this means flexion of the head is induced. At the same time upward pressure is made with the fingers of the other hand upon the occiput; then, by raising the trunk, the face is rolled out over the perineum. In case this method fails, we should use the combined method by placing two fingers in the child's mouth and, by traction upon the lower jaw, flexion should be accomplished. With the other hand, traction should be made upon the shoulders, and as the head descends the body should be raised, whereby the face sweeps over the perineum. By the combined method, there is obtained the greatest amount of traction force, in combination with the least degree of violence to the child. As the power is exerted chiefly upon the shoulders, the fingers in the mouth are not likely to fracture the jaw. When the occiput is turned into the hollow of the sacrum, forehead against the symphysis, the process just described should be reversed, as the fingers are forked over the shoulders, the back of the child should rest upon the arm, and, with one or two fingers of the other hand the chin should be flexed, traction made downward and the forehead rotated under the symphysis.

*Extraction with the Head at the Brim.*—Schroeder, and a considerable portion of the modern German School, employ combined traction upon the shoulders and chin for all emergencies alike, whether the head be high or, after its entrance into the pelvis, as the life of the child depends upon the speedy extraction of the head, it is well to become familiar with the different procedures, so that if you fail in one you can resort to the other.

The Prague method consists in seizing the feet, with one hand, and drawing the body of the child nearly directly downward. The fingers of the other hand are hooked over the shoulders of the child, traction is exerted with both hands simultaneously and, in the absence of pain, pressure should be made upon the head by an assistant. After passing the superior strait, the procedure should be as described above.

Forceps to the after-coming head has been condemned by some, and warmly approved by others. Personally I have never had any experience with them in any of these troubles, but it is recommended by some authors in overcoming the resistance of a rigid perineum in strongly built primiparæ, but it is chiefly indicated when both chin and occiput are arrested at the superior strait. With the chin anterior the forceps should be applied under the back of the child, and the handles raised so as to bring the occiput into the hollow of the sacrum. With the chin to the rear, the forceps should be applied under the abdomen of the child, and the face of the child drawn into the hollow of the sacrum.

When the arrest of the head is due to stricture of the os uteri, the forceps will sometimes bring the head rapidly through the cervix, when traction on the feet only serves to drag the uterus to the vulva. In stricture of the cervix great care must be exercised to avoid laceration, as under no circumstances are extensive ruptures of the

lower uterine segment more apt to occur than in the forcible extraction of the after-coming head. The axis traction forceps are particularly serviceable in these cases.

## AMBER YELLOW GLASS IN THE EXAMINATION AND TREATMENT OF EYES.*

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In these days of revolutionary scientific discoveries, among the most interesting of revelations are those bearing upon the physics of light. The exact nature of the X-ray has not yet been determined, and the discovery of radium and its properties has brought into question the law of the correlation of forces, and threatens the overthrow of the theory of the luminiferous ether. Medical workers have not considered it necessary to wait for a determination of these theoretic considerations, before applying any known forces to practical use; the X-rays are being used for valuable diagnostic and therapeutic achievements, and Finsen, utilizing well-known laws of light and color, controls the suppuration of smallpox, and institutes the most successful treatment of lupus as yet known.

While the study of phototherapy is being thus energetically carried on about us an occasional discussion as to the amount of white light proper for inflammatory and postoperative eye cases seems to satisfy the minds of most ophthalmologists. The largest eye hospital in this country is rendered gloomy and unhealthy with window shades of a dark indigo blue. Blue glasses, relics of a scheme conceived in previousness some twenty-five years ago, are still used to protect eyes, although the color is the worst, or one of the worst, for this purpose. "London smoke" is no doubt superior to blue for such protection, which is, nevertheless, only partial, and obtained at the expense of diminished vision. It has been shown that the blue-violet or actinic rays are the only ones capable of causing irritation or chemical inflammation of the eyes, having an analogous action to that upon the skin, or the photographic film. Some observers inform us that these rays do not penetrate glass, but we must evidently modify this if we accept the former statement. Photographs are taken through a white glass lens, and may not be developed in light shining through white glass; a pin hole photograph may be taken through a small aperture in amber yellow, but not in white glass. The irritating effect of light upon certain eyes is often only slightly diminished by white glasses correcting the refraction, although there is some protection from heat, and irradiation of light within the eyeball is decreased. Furthermore the spectrum with the violet rays is obtained with a prism of white glass.

In attempting what might be called photochromotherapy of the eye we must deal with peculiar conditions, in that we are working upon a complicated organ of special sense, highly sensitive to pain and irritation with a constant demand that the visual function shall not be impaired. If the suppuration of smallpox may be prevented by red light, it is natural to suppose that this color would benefit abscess of the cornea; yet red is an irritating color to the central nervous system of some persons, and its action upon the retina may be by no means pleasant. If actinic rays from electric light may cure lupus, perhaps mycotic keratitis would yield to them; yet their application to the eye might result in chemical inflammation, so that the first trial of this treatment would seem to call for caution, even in an old case of dense pannus.

The preceding considerations in the course of time directed the interest of the writer to the green and yellow rays for purposes of ocular therapeutics. The former color best protects the eyes from heat, but imperfectly from the blue rays, and diminishes the light; the latter, as obtained through amber-yellow glass, gives but little protection from the heat rays but almost perfect protection from the chemical rays.* In addition, vision is not impaired by the yellow glass, and since the yellow ray is taken as the standard for determining the index of refraction, formulæ for correcting glasses are interchangeable between yellow and white. The chromatic aberration of the eye is corrected in the only manner yet suggested, simply and practically, centrally and peripherally, by the amber yellow glasses, and dazzling reflections from such surfaces as that of the cornea, or from glazed paper and other objects, are softened and modified.

For the purpose of applying these principles to oblique and indirect examinations, I had made about two months ago, a lens with a focal distance of 2½ inches. Because of the difficulty of obtaining glass of the required color, a bi-convex lens of white glass was split and cemented upon a plain glass of medium light amber yellow. This proved to be a success, and the manufacturer has pointed out that a lens of this power, ground of colored glass throughout would be darker at the center than at the periphery, while the one described is of a homogeneous tint. With this lens there is less congestion, lacrymation, photophobia and pain in examined eyes than without it; it is, therefore, suitable for examination by the oblique method of lesions of the cornea, iris and ciliary body. Discoloration of the iris with the yellow light might cause some mental confusion to the examiner before he becomes accustomed to it, and the dulled corneal reflex makes the appreciation of a foreign body upon the cornea less easy to the novice, because of diminished contrast between the foreign substance and its background. In examination of the ocular fundus by

* Read before the Section on Ophthalmology of the New York Academy of Medicine, April 20, 1903.

* Spectroscopic analysis does not show this to be as perfect a ray filter as, for instance, glass stained with a saturated alcoholic solution of tropæolin 000, with which it was compared. Amber-yellow seemed, however, to be the most practicable color in grinding the glasses and as the sequel will show, was eminently successful for the purposes required.

the indirect method the yellow lens is more comfortable than white for both examining and examined eyes, and the picture of the background is not much changed by the lessened reflex from the retinal vessels. The sphincter of the iris is not contracted so much by yellow as white light, sustaining the suspicion already entertained by some of us that the actinic rays are the most active in causing contraction of the iris: of course the relaxed pupil has its advantages in diagnosis and treatment. Should one wish yellow light for direct examination, an adjustable glass of the desired color for the source of illumination might be used, or a reversible ophthalmoscopic mirror could be stained upon one side. A thin yellow disc to slide on and off the mirror of the "Loring" was made at my request but has not seemed particularly useful as yet.

Before proceeding to the treatment of eye diseases with yellow glasses it seems well to note some effects upon healthy eyes. Comparisons are mostly made between eyes with or without the amber yellow glasses, not between corrections in yellow or white. The glasses are numbered in the usual manner, but the darker ones seem unnecessary, and from No. 1, the lightest, to 3 all-sufficient. In the investigations described No. 2 was used unless otherwise stated. The first observations made were upon vision: in about 60 per cent. this was unchanged, in over 35 per cent. improved, in less than 5 per cent. diminished. Diminution of vision, in no case of any considerable degree and improvement, one-fourth of the time amounting to an extra line on the test card at 20 feet, occurred in eyes having an appreciable amount of regular astigmatism. Failure in correcting the increased aberration caused by a larger pupil would account for poorer vision, success in the same direction for better sight with decreased irritation from elimination of actinic rays as an additional factor. The effect of yellow glass upon accommodation is hardly appreciable, but there is probably slight relaxation. As might be expected the effect upon spectral blue and pigment blue is different. The sky has a grayish or leaden hue, and light blue stained or painted objects have a greenish tinge; darker blue pigments show more suppression of the color and may appear gray or black. Adjustment of the new color values takes place after a few moments' wearing of the glasses. These do the most good upon certain dull days when the actinic rays are strongest, and least upon rainy days. More color saturation is perhaps needed for protection from intense electric or gas light than sunlight, but less for a kerosene burner.

The indications for the use of yellow glasses in the treatment of asthenopia and ocular neuralgias are in some cases easy to determine. Take, for instance, a young girl, with little pigment in the iris and retina, who suffered from pain about the eyes and forehead after an attack of chickenpox; sph. + 0.25 was the only glass accepted and there was orthophoria; bright light produced or increased the symptoms. The correction of the refraction with white glass failed to give relief, which was accomplished by a change to yellow glass. The method would seem likely to be an important addition to the present forms of treatment for asthenopic cases with hyperesthesia of the retina, but perhaps it would be well to be cautious in its use because of possible secondary effects. Patients vary in their statements regarding the effect of blue light after the removal of their glasses and the matter is too intricate to be decided upon the theory of complementary colors. Just what place yellow glass corrections should take in astigmatic and muscular asthenopia is a matter of supposition on my part, as Messrs. Gall & Lembke, the opticians, notwithstanding their interest and energy in the matter, have been unable to grind cylinders and prisms in this glass until very recently; and I have not been able to obtain reports of results in the cases where they have been ordered. For the sake of the appearance No. 1 glasses have been used, although less effective as a ray filter than No. 2.

In cases of corneal disease, two with superficial central keratitis had improved vision with the yellow glass, and in one, the improvement seemed to be continued after removal of the glass, thus: $^{20}/_{70}$ with smoke glasses No. 2, $^{20}/_{50}$ after these were removed, $^{20}/_{30}$ with the amber yellow glass, $^{20}/_{40}$ after removal. More peripheral corneal affections, three ulcers, four phlyctenular, three with pannus were not improved as regards vision, but the latter at least appeared to have less irritation: in one of these, with chronic conjunctivitis following trachoma, the glasses were ordered, and persistent pain increasing in severity as the day advanced, was relieved from the first day they were worn; within five days ocular congestion disappeared.

In the first four cases with incipient cataract vision was not improved as shown by the test types; in two where the glasses were worn the result as regards the irritating effect of light upon the eyes was satisfactory, as it was in fact in all other cases. Just two days ago, four eyes (two patients) with incipient cataract showed improved vision in three, one from $^{20}/_{160}$ to $^{20}/_{50}$, congestion of the eyes in the latter case being relieved in a few minutes, but reappearing when the glasses were removed. This patient, forty years of age, is the third of her family under my care with premature cataract, and from the histological analogy between the crystalline lens and the skin, and the destructive action of actinic rays upon the tissue of the latter, it seemed no idle fancy to suppose that chemical action of light might have caused the lenticular disease, or to imagine a possible beneficial effect upon it in its incipiency from persistent yellow glass treatment.

The first pair of amber yellow glasses ordered by me were used successfully in a case of postoperative iritis, and it should need no argument to convince others of the utility and superiority of this color over others in such cases.

The effect of the glasses upon choroidal and retinal cases remains to be noted. A patient with

posterior synechiæ and hazy media in both eyes showed diminished vision in one eye with yellow glass before atropine, but improvement in the other, and improvement in both after atropine. Irritation was less, and it is to be understood that this is the result in all cases, whether so stated or not, either in simple tests of the eyes, or when the glasses were regularly worn. Two patients with chorio-retinitis and vitreous opacities, one severe, one mild showed improved vision.

The most beneficial results might, perhaps, be expected in that class of cases having diminished vision and hyperesthesia of the retina, as occurs with glaucoma or tobacco amblyopia, and I am able, fortunately, to report three such cases. The first had acute glaucoma of over two months' duration, in the right eye, when I saw her, out in the country, nearly four months ago. Posterior sclerotomy, followed by eserine, relieved the pain and lowered tension, but there is still ciliary injection and lacrymation; the other eye is healthy. This patient reports the relief from bad effects of light to be much greater with yellow than "smoke" glasses; better vision in the sound eye of course; the other has $V=\frac{1}{\infty}$. The second patient has chronic glaucoma in each eye with complications from excessive use of tobacco; the vision and field have improved with pilocarpine locally and strychnine internally and this improvement has been held about eighteen months. During this time the only unpleasant symptoms have been sensitiveness to light and subjective color sensations, these have been relieved with amber yellow glasses after "smoke" glasses had not met with success. The third patient, over seventy years of age, had acute glaucoma in one eye, chronic in the other, both eyes having corneal macule, which latter had previously been the cause of poor vision, worse in the eye with the acute attack, which now has $V=\frac{1}{\infty}$. The other eye had $^{20}/_{100}$, corrected, with the nasal portion of the field down to $7^{\circ}$ from the fixation point. Radical operation being considered inadvisable, posterior sclerotomy was done upon the eye with the acute attack, and eserine used in both. This treatment relieved the one eye of its acute symptoms, and the other has had no deterioration of vision or field for a year. Retinal irritation from light was annoying, and only partly relieved by "smoke" glasses, which gave $V=^{20}/_{200}$. The eyes are comfortable with amber yellow glasses and $V=^{20}/_{70}$ with them.

It will be seen that the above reports show conclusively that amber yellow glass has certain good effects upon the internal structure of the eye. Only a hint is given as to the effect upon external inflammations, for, with glasses mixed light must be admitted from the sides. In order to properly show the effect of light of any color upon external inflammation of any character, a specially lighted room would be necessary. There is a class of cases in which I am particularly anxious to see the effect of selected light, and where a failure with amber yellow glasses will not necessarily preclude success with some other color. These are the eyes with summer conjunctivitis, often with papillæ, follicular granulations, or phlyctenules, where there is photophobia with lacrymation. The irritation seems to be kept up by various forms of dust, or by bright light, but it is by no means sure that the heat rays are not a contributing cause. Treatment of these cases during the summer season has so far met with indifferent success. Amber yellow glasses are well worth trying for these eyes, since in others, they are a protection from irritation and improve vision.

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## THE TREATMENT OF CHRONIC CATARRHAL DEAFNESS (OTITIS MEDIA CATARRHALIS CHRONICA).

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A BRIEF résumé of the etiology and pathology of Otitis Media Catarrhalis Chronica may be of profit as a preliminary to the discussion of this disease from a therapeutic standpoint.

Among the more common exciting causes of catarrhal deafness, adenoid vegetations and other nasopharyngeal abnormalities occupy a prominent place. By their pressure they excite catarrhal conditions which frequently terminate in a partial or complete occlusion of the Eustachian tube, hindering drainage and forming a nidus for an army of bacteria which subsequently invade the mucous membrane of the tympanum; the mucosa of the middle ear becomes thickened and the tympanum filled with exudate. The whole structure gradually becomes involved, the membrana tympani becoming thickened and frequently filled with chalk deposits.

Occlusion of the tube occurs with contraction of the tensor tympani, and anchylosis of the various joints of the ossicles is a later development followed by dragging in of the entire membrana tympani toward, or even against, the promontory. Even hyperostosis of the ossicles may occur.

Ultimately sclerosis, with fibrous and osseous anchylosis of the plate of the stapes, pressure upon the endolymph and interference with the circulation within the entire capsule results. Although there is an anastomosis between the vessels of the tympanum and labyrinth, it is so circuitous that pathological conditions in the latter must rather be ascribed to pressure than to circulatory disturbances.

Tinnitus may depend upon defective circulation, arteriosclerosis, anomalies of tension in the membrana tympani, tubal contraction or constitutional causes.

Hyperplastic cases are characterized by increased density in the fibrous portion of the tympanic mucosa, diminished size of the glands, reduced secretion with new tissue formation and contraction of the ligaments, resulting in dislocation of the ossicles and membrana tympani.

Finally, there is anchylosis of the ossicular chain or chalky deposits in the oval window. Some cases are due to defective teeth, as dental irritation from cavities or defective fillings may cause irritation of the otic ganglion.

Heredity is an important factor in many cases. There may exist an inherited predisposition to catarrhal or purulent inflammation of mucous membranes in general, and of those lining the cavities of the middle ear, nose and pharynx in particular.

Anatomical development is an important factor in the predisposition to ear affection. Deep niches in which are set the round and oval windows, unusual development of the promontory, extra thickness of the tegmen tympani and general reduction in the size of the attic necessarily favor adhesions and deafness after inflammation. De Schweinitz reports that an examination of 400 boys, generally healthful and athletic, in a Philadelphia school, showed hardly 24 normal drumheads.

Improper dressing (excessive dressing, perhaps, oftener than insufficient dressing); exposure when overheated and the wearing of thin-soled shoes are prolific sources of trouble.

Fully 60 per cent. of all cases are due to nasopharyngeal catarrh. Measles, pertussus, hayfever and similar affections have their influence on account of the extension of catarrhal inflammation to the middle ear. Rickets frequently figures prominently in the etiology of these cases.

Disordered digestion aggravates and perpetuates a large proportion of cases, not a few of which are unsuccessfully treated because this important causative factor is overlooked.

Gout is another important factor sometimes overlooked, gouty deposits being more frequently found in the ear than in any other organ.

Pathological defects in the ciliated epithelium lining of the Eustachian tube permit invasion of bacteria from the nasopharynx.

Five per cent. of all scarlet fever cases develop otitis media, while the rapidity with which destruction of the ear may result from diphtheria is almost incomprehensible. The ears are frequently involved in measles, but the disease rarely goes beyond an acute catarrh.

Typhoid fever may be accompanied by an otitis which is frequently overlooked.

The prognosis in cases of chronic catarrhal otitis media is not nearly as unfavorable as many suppose. The failures so common in our treatment of these cases are usually due, either (1) to insufficient study of the etiology and pathology of the case under treatment, or (2) to lack of persistency in pursuit of the treatment indicated. For the former the physician may be responsible, for the latter the patient is usually to blame, though patients are not usually so hard to manage if every promise to them is made conditional upon faithful, long-continued application to treatment. Many a case which looks hopeless can be wonderfully benefited by a year or two of persistent, rational treatment, to which the patient gives proper aid. A close study of every possible etiological factor in every case under treatment is absolutely imperative to secure good results.

Frequently the mode of life on the part of the patient must be wholly changed. General medication and close attention to general hygiene are imperative, since the effects of overtire and nervous overstrain, increased still further by the fatigue incident to a considerable degree of deafness, interfere with the nutrition of the more delicate structures of the body, and so favor trophic changes which are evidenced in the ear by still further impairment of hearing.

The diet must be closely studied and absolutely controlled in each case.

The abuse of alcohol, tobacco or other narcotics must be avoided.

The daily cold bath, unless distinctly contra-indicated should be insisted upon. Even the question of suitable underwear should be closely and strictly controlled. Some cases have been helped more by the prescription of linen-mesh underwear than by months and years of local treatment. Many patients are almost "clothed to death"; the more wool they wear the more frequently they "take cold," and the more rapidly they go on from bad to worse.

Adenoids or hypertrophied tonsils, when present, must be removed with as little delay as possible, unless some distinct contraindication to prompt operation exists. When thickening of the Eustachian mucous membrane, together with abnormally increased prominence of its folds and increased secretion from its glands cause occlusion of the lumen, means must be provided to secure ventilation of the middle ear. Appropriate treatment of the tube will usually give the desired ventilation by removing the occlusion.

Among the most satisfactory agencies for accomplishing this end, except in very serious cases of occlusion, we find medicated vapor.

By its employment vapors of menthol, eucalyptol, camphor, benzoin, iodine and other suitable remedies may be applied to the entire diseased area. Such a vapor given warm and under a proper pressure, restores the intratympanic air pressure, and mechanically stimulates the mucous membrane of the tube and tympanum. It causes an increased flow of blood to the parts, favoring absorption of recent inflammatory deposits or relieving chronic congestion due to lack of tone. It is possible also by employing an intermitting flow of vapor to massage the tympanum and ossicles with any desired force and frequency while medicating the entire mucous membrane with the selected medicament. For years the writer has found exceptional satisfaction in a special nebulizer for this purpose which furnishes a warm vapor instead of the cold vapor usually employed in this work. The instrument is made from noncorrosive metal without rubber lining or rubber parts, it being unsafe to use superheated air or warm vapor through an instrument having rubber parts. This special nebulizer also has an ozone attachment so that ozone alone or in com-

bination with other vapors may be applied to the tube and tympanic cavity, ozone having very marked stimulating qualities, which give it marked value in a certain large class of cases.

Compressed air, heated and charged with ozone constitutes one of the best agencies known to therapeutics for inflation of the Eustachian tube and middle ear, but is of little value, as is any vapor or gas for inflation, if marked occlusion of the Eustachian tube exists. This device generates ozone from an incandescent lighting current and supplies it in abundance whenever desired. In cases having a tendency to slight Eustachian occlusion, it is well to employ a spray or vapor of adrenalin to the Eustachian orifices for a moment before attempting through inflation. Indirect inflation without a catheter has some advantages in cases where it is sufficient. Unquestionably the Eustachian catheter method is very much abused, and in some hands works injury to the ear.

If the tubal obstruction be of long standing it may be necessary to resort to mechanical dilation, many employing Eustachian bougies having their tips covered with cotton for this purpose. A far better method, in skilled hands, consists of electrolysis. Dench's gold electrode, properly applied, rapidly removes tubal obstruction of long standing, but its skilful employment requires a thorough knowledge of electrotherapeutic principles. Indeed, a very excellent aurist may make a miserable failure of the operation if his training in electrotherapeutics be deficient, while on the other hand a very ordinary aurist who is skillful in the use of electricity will secure results which cannot be obtained in any other known way. To such a one the operation is reasonably simple, safe and certain. Several precautions must be observed in its employment, *i.e.*, (*a*) Neither heavy nor uncertain currents should ever be employed; (*b*) perfect current control (preferably by a shunt circuit rheostat) is absolutely imperative; (*c*) the current employed should not be of less electromotive force than 30 or more than 35 volts; (*d*) The current strength should never exceed 1½ milliamperes at the beginning or five milliamperes at the end of a treatment, and the latter amperage should be very slowly approached. Many cases require no more than four milliamperes. (*e*) Treatment should never be given less than three days apart; (*f*) force should never be employed; (*g*) reliance should be placed upon a number of light treatments rather than upon a few heavy ones; (*h*) polarity of current should never be in doubt.

These points, carefully observed, remove every element of danger from the operation and leave the opponents of the operation without any ground upon which to base their opposition. Skilled operators have obtained brilliant results in a large number of these cases, and such operators will continue to get such results regardless of any criticism which may come from those who are less skilled in applying this particular form of treatment.

If the treatment be employed with reasonable skill and with due observance of the precautions mentioned the several cases of failure will be eliminated. There cannot be much pain if the voltage and current strength are properly controlled and all necessary changes of current-strength slowly and carefully made. There can be no re-formation of stricture as a result of treatment unless the current be excessive, of wrong polarity or applied too frequently. There can be no formation of a fistula unless the operator forgets the anatomy of the parts and only then, ordinarily, by the employment of excessive current or undue force. Properly employed, this treatment causes the stricture to fairly melt away beneath the slowly advancing electrode until the tip of the electrode is felt slipping into the space beyond the stricture. This method is probably the best one ever devised for such cases of catarrhal deafness as are entirely due to occlusion of the Eustachian tube.

A nice modification of this treatment consists of using a cataphoric electrode at the anode or indifferent pole, saturating it with a suitable iodine or ichthyol solution (iodine vasogen or ichthyol vasogen being sometimes preferred), and holding it against the membrani tympani during each electrolytic operation.

During the past few months experiments have been conducted by the writer with a kind of "electric douche" which has been applied to the entire intratympanic cavity, and while it is rather early to report results, yet there is already much evidence to indicate that possibly, when fairly perfect appliances have been secured and a better technic acquired, catalectrolysis may be made to act as favorably upon old organized inflammatory deposits in the ear as it does upon similar deposits elsewhere, softening them and stimulating their absorption, in which event it will perhaps equal in importance the superheated air method, though it will doubtless require some years of work and experience to bring it to the same degree of perfection.

The promptness with which relief follows this electrolytic-cataphoric application is sometimes remarkable.

Iodine cataphoresis is a valuable adjuvant in certain selected cases, the auditory canal being filled with iodine solution and a cataphoric electrode applied, anode direct, to the tympanum.

Pneumo-massage of the tympanum externally has yielded splendid results in the hands of Pynchon and a few other experts who have paid proper attention to technic. In the hands of some others it has probably done as much harm as good. The rule governing its application is that for simple middle ear cases, slow vibrations should be practised, while more rapid vibrations are advantageous in the cases accompanied by labyrinthine or nerve involvement.

In the experience of the writer, massage with medicated vapor through the Eustachian tube has yielded more uniformly satisfactory results, but the best results cannot be hoped for unless the

vapor is as warm as can be comfortably borne by the patient.

Removal of the membrani tympani and ossicles has been practised in desperate cases by some excellent operators, but the results are of so doubtful a character that the operation should only be employed when grave melancholia from tinnitus or some similarly urgent indication exists. Some six years ago the writer was so impressed with the brilliant results yielded by superheated air in the treatment of certain articular and chronic inflammatory diseases, pathologically similar, in many respects to cases of a certain type of chronic catarrhal otitis media, that he resolved to try this agency experimentally in suitable cases of chronic catarrhal deafness. The very satisfactory results of the experiment have been reported from time to time (*Medical Record*, June 1, 1901; *Annals of Otology, Rhinology and Laryngology*, February, 1902). Scores of cases which have obstinately resisted every other form of treatment have slowly, but gradually progressed under the application of superheated air to the tympanum until marked improvement in hearing and relief of tinnitus has resulted. It is doubtful whether one in the whole number treated now by this method has perfect hearing, but every patient discharged (since contra-indications have been determined and closely observed) has been perfectly satisfied with the result.

In the early experiments the heat was secured from a crude room heater with a funnel top and a canvas sleeve air conductor, but this was soon displaced by a compressed air heater which drives the superheated air against the tympanum with as much or as little force as may be desired. A temperature varying from 250 degrees to 400 degrees F. is thus applied and is easily borne if the maximum temperature is slowly approached. Of course, *moist* heat could never be applied at such high temperatures or to as much advantage. It is unfortunately true that some of the compressed air heaters now on the market are mere toys and fail utterly to yield a curative temperature, or yielding it furnish it at an improper rate of elevation so that a curative temperature cannot be tolerated by the patient. The writer employs an electric compressed air heater which acquires its maximum temperature from a given air pressure in ten minutes and finds the rate of elevation just about right. If the temperature is then well borne it is raised still higher at the ear tip by gradually increasing the air pressure. Ordinarily the treatment lasts about 15 minutes or until the limit of toleration is reached. No fixed temperature can be employed in all cases, the operator being governed entirely by the individual toleration of the patient under treatment, the toleration not only varying widely in different patients, but in opposite ears of the same patients even under precisely similar conditions.

It is necessary, of course, that the ear under treatment shall be clean and packed with dry gauze (two thicknesses) to prevent scalding from the boiling of any moisture present, and when it is done there is absolutely no danger of burning.

It is only by taking this precaution that high temperature can be employed without burning. The benefit derived from applications of dry heat is directly proportional to the degree of heat applied and high temperatures can neither be tolerated or safely applied in the presence of any accumulated moisture. It has been pretty well demonstrated that intense dry heat stimulates the circulation through the blood supply on the posterior side of the manubrium, causing absorption of the articular deposits; removing atrophy and relieving rigidity of the tensor tympani. The ossicles lie so near the surface that they receive the full benefit of heat applied to the tympanum and adhesion between portions of the ossicular chain and the adjoining bony walls of the middle ear are readily removed.

Naturally, much better results are secured in the same period of time in hypertrophic cases than in those characterized by hyperplasia; but many cases of the latter type, which would ordinarily have been regarded as hopeless, have gradually acquired marked improvement under this treatment. Occasionally slight vertigo or headache results from treatment, but is very transient in character and requires no treatment. Vertigo may become serious if heat be applied to both ears on the same day and it is, therefore, unwise to make such applications. The writer regards as contra-indications to this treatment, arteriosclerosis, serous effusions into the tympanum and perforations of the tympanum. As an exclusive treatment it is rarely of much value in serious cases. When carefully employed it is absolutely safe unless contra-indicated. It is of little value in old subjects who have extensive labyrinthine involvement. Superheated air (especially when compressed) acts more favorably upon the ossicular chain than upon many other articulations because of the exceptional proximity of the entire bony structure to the surface.

Treatments are best given three times a week for from three to twelve months. The writer sometimes gives daily treatments for the first month, but if any additional dulness of hearing is observed as a result of treatment the intervals are immediately lengthened. A good routine practice consists of inflating the Eustachian tube and middle ear with a *warm* vapor from a good nebulizer at the conclusion of every superheated-air treatment. The superheated compressed-air treatment, when indicated and judiciously employed, *in conjunction with such other measures as may be indicated*, will give results which would be utterly unattainable without its aid.

Obstinate cases of this disease usually call for a combination of agencies, each of which has its own indications, but good judgment is often necessary to avoid meddlesome therapeutics.

Every case must be treated as a whole; every indication must be met. All abnormal conditions of the nasopharynx must be properly treated. The Eustachian tube and middle ear must be care-

fully attended to. Antiseptic washes must be used often enough to maintain a clean mucous membrane; different cases frequently requiring very different washes.

The selected irrigant in any case should be capable of dissolving the secretion to be removed, readily soluble in water, non-irritating to mucous membranes and sensitive surfaces and possess the power of penetrating surface tissues. It is an advantage if it is chemically compatible with suitable antiseptics. The sulphates of sodium, potassium, magnesium and ammonium fulfil these requirements well in cases characterized by viscid or inspissated, "crusty" secretion, provided the solutions are not stronger than two per cent. Considerable quantities of the selected irrigant should be used each time, from six to eight ounces being usually required to thoroughly cleanse the nasopharynx.

Antiseptic solutions can sometimes be employed to better advantage after thorough cleansing has been accomplished. The temperature of an irrigating solution is of some importance and should be about equal to body temperature.

In office practice some good device like the Terry electric solution-heater affords an easy and quick method of bringing the selected solution to the desired temperature for application. Cold vapors should never be employed in catarrhal cases and especially after applying high temperatures to the tympanum. Warm vapors are absolutely safe, if not too hot, and are of far greater value in treating these cases.

Of course, very high temperatures cannot be used on mucous membranes, owing to the fact that they cannot be kept dry during treatment and a temperature of 300° to 400° F. would cause scalding, hence this can be in no sense a substitute for the superheated air applied directly to the tympanum through the auditory canal, but warm medicated vapor for Eustachian and intratympanic inflation has a large field of its own, which no other agency can fill.

## THE CLINICAL VALUE OF BLOOD PRESSURE.

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The observation of the pulse by the finger touch has been for centuries a valuable aid to the practitioner, but the knowledge acquired has never been scientifically accurate. The terms hard, soft, high and low tension, high and low pressure, are not definite, and do not admit of exact records for comparison. Like the other senses, touch has its limitations, and the terms used are relative though of clinical value. Dr. Oliver, of London, has repeatedly proved, by the conjoint use of the hemodynamometer and the arteriometer, that the finger touch is very frequently at fault in estimating the arterial blood pressure; and that the cause of this tactile illusion is a reduction in the caliber of the radial artery; the finger failing to realize a rise in the arterial blood pressure when the artery is contracted below normal size; he states that the unaided finger can only estimate the blood pressure in a general way when the caliber of the artery remains normal or is enlarged. He has found radial arteries of little more than half their normal caliber, having a mean pressure of 160 to 200 mm. Hg., which were passed by well-trained fingers as not presenting an exceptionally high blood-pressure.

Many instruments have been devised for the observation of the pulse and of the blood-pressure, but the usefulness of most of them has been confined to the physiological laboratory. The sphygmograph has largely passed into disuse for clinical purposes on account of the difficulty of its application. The weak point appears to be that the transmitter is solid, and also it is almost impossible to fix the pressure of the pad on the artery so that the pressure exerted by the pad is equal to the pressure in the artery. An instrument so arranged to insure the tracing being taken at the proper pressure, would give more certain and more valuable results. Several instruments have been devised for the purpose of obtaining accurate observations of blood-pressure for clinical purposes. Roy's oil sphygmometer was probably the first instrument which promised success; it was followed by those of von Basch, Riva-Rocci, Gärtner and others; but they only measured the systolic or maximum pressure, the arterial pressure or mean pressure not being obtainable. Dr. Oliver invented an instrument by which not only was the maximum and mean arterial pressure obtainable, but also the venous pressure. The manipulation of this instrument requires considerable skill and practice, so much so that the personal equation is a disturbing factor in comparing results obtained by different observers. Drs. Hill and Bernard have introduced an instrument which is exact and practically eliminates the personal equation in the observations.

The instrument consists of a rubber bag connected with a dial graduated in mm. Hg. The bag is securely and tightly fastened around the arm or leg of the patient, and air pumped into the bag till the pressure is sufficient to close the artery; the point of closure being indicated by the cessation of the oscillations of the needle of the aneroid. To obtain the mean pressure, the air is allowed to escape from the bag until the maximum oscillation of the needle occurs, at which point the pressure in the artery and in the bag are the same. It requires very little practice to become familiar with the instrument.

There are two pressures in the arterial system which can be estimated by this instrument, viz., the maximum or force of the systole, and the mean or the pressure in the artery. As the arteries collapse if empty, it is evident that the force required to obliterate them when full will represent the force of the blood driven into them by the heart. There would appear to be some variation caused by the pressure required to overcome the resistance of the tissues surround-

ing the artery, but in practice, if the arm is extended and the bag and collar put on as tight as possible, and the arm flexed, there is very little, if any, falsification of the results from this general cause.

Experiments on animals have proven that the pressure in the left ventricle and that registered by the instrument are the same.

If the artery were a blind tube with no outlets the pressure in it would be equal to the heart force, and the heart would be arrested; but there is during the whole cardiac cycle a continuous outflow of blood through the arterioles which causes the pressure in the artery to be about 25 per cent. less than the systolic pressure. As the aortic valve closes immediately after systole, the diastole of the heart can have no effect upon the pressure in the artery, provided the aortic valve is intact. The difference between the maximum pressure and the mean pressure is, therefore, due to the blood flowing out through the arterioles.

It has been shown that the capillary pressure is only one-fourth of the arterial pressure, consequently we would expect to find that the difference between the maximum pressure and mean pressure would be 25 per cent.

I made a number of observations on healthy individuals, taking the maximum and mean blood pressure in the recumbent position at 11.30 A.M., and found a mean pressure varying from 100 to 120 mm. Hg., and a maximum pressure from 140 to 160 mm. Hg., taking the average $\frac{\text{mean pressure } 109}{\text{maximum pressure } 150} = 0.73$, or in other words, the mean pressure is 73 per cent. of the maximum pressure; the capillary pressure will therefore be 27 per cent.

That the point of greatest oscillation represents the pressure in the artery has been proven by experiments on animals; with a manometer inserted in the carotid and the instrument on a limb, it was found that the point of greatest oscillation corresponded with the pressure recorded by the manometer.

The oscillations of the needle should theoretically represent the fall of pressure in the artery during closure of the aortic valve; I have found this loss of pressure to be equal to about 4 mm.; I have nearly always found aortic regurgitation or dilatation of the left heart if the fall in pressure was over 6 mm. Hg.

By this instrument the maximum or systolic pressure, the mean or arterial pressure, the loss of pressure in the artery during the cardiac cycle representing the flow of blood into the capillaries and by difference the capillary pressure can be observed.

It must be noted that the above observations were made with the patient in the recumbent position with the arm at the level of the heart; the patient was kept in this position for some time before the observations were taken, in order to do away with any increase of pressure from physical or mental activity. The average pulse rate at the time the observations were made was 63 per minute.

The clonic contractions of the heart, and the tonic contractions of the arterioles are the determinates of the arterial pressure; if the arterioles dilate, a larger amount of blood flows from the artery and the mean pressure falls; if the arterioles contract, less blood flows from the artery and the mean pressure in the artery rises. There is a compensatory action between the arterioles and the heart; when the former contract there is a back pressure on the ventricle, while at the same time more blood is forced through the coronary arteries, and the force of the heart systole is increased. Should the contraction of the arterioles become considerable, the back pressure on the heart may be so great as to prevent the left ventricle from emptying itself, which will produce dilatation. If the arterioles are dilated the pressure in the artery is reduced, as in exercise the heart, relieved of the back pressure, empties itself more easily and beats quicker; more blood passes to the venous side of the circulation, the arterioles regulating the supply of the blood to the venous system, and there is a greater bulk of blood passing through the body.

Under normal conditions there is a postural variation in blood-pressure. On taking the erect position the mean blood pressure rises owing to a contraction of the arterioles in the body; if this compensatory contraction did not take place, on taking the erect position the blood would gravitate to the abdomen and syncope ensue. When fatigue is so great as to become a pathological condition, the postural variations of blood-pressure are reversed, viz., on taking the erect from the recumbent position the blood-pressure falls to to 20 mm. Hg. In neurasthenia and analogous conditions I have found that the reversed postural variations of blood pressure exist, so that it would seem that at least one of the pathological conditions of neurasthenia is a failure of the vasoconsrictor nerves to react. In three cases of neurasthenia I found the following conditions:

| | Horizontal | | | Sitting. | | |
|---|---|---|---|---|---|---|
| | Pulse | Mean P | Max. P. | Pulse | Mean P. | Max. P. |
| (1) | 96 | 148 | 170 | 105 | 134 | 160 |
| (2) | 78 | 150 | 180 | 84 | 142 | 174 |
| (3) | 94 | 132 | 146 | 110 | 124 | 130 |

Standing.

| | Pulse | Mean P. | Max. P. |
|---|---|---|---|
| (1) | 110 | 128 | 145 |
| (2) | 126 | 125 | 155 |
| (3)* | 128 | 114 | 124 |

Probably in no condition is the observation of the mean blood-pressure and its relation to the maximum of more service than in the early diagnosis of Bright's disease, when the headaches, fainting spells, etc., begin, and even before the apex beat has moved to the left, a very high mean blood-pressure will be found which will at once suggest Bright's disease; it is probable that the albuminuria does not occur until the high

* Case 3 had a very weak and irritable heart.

arterial pressure has reacted through the left ventricle and caused venous congestion.

The action of the bromides on the blood-pressures is interesting. I had the opportunity to take the blood-pressure of an epileptic for eleven weeks, during part of which time he took no drugs while for four weeks he took 20 grains of bromide three times a day. During the period when he was taking no drugs the blood-pressures were usually a little above normal; but about four or five hours before a spasm the blood-pressure began to rise; on one occasion he had a spasm while the instrument was on his arm when his mean pressure rose to 227 and the maximum was above 250 mm. Hg. (The instrument only registers up to 250.) Under the bromides, both his mean and maximum pressure steadily fell, and for three weeks he had no spasm; at that time his mean pressure had fallen to 93 mm. Hg., and his maximum pressure to 135 mm. Hg. at which point he had several very severe attacks, and was confined to his room. During the bromide period his pulse rate fell from 86 to 66 per minute. This would seem to show that the action of bromides was on the vasomotor nerves, or upon the heart muscle.

In melancholia simplex I found that there was great contraction, the patients having a high mean and a low maximum pressure. In six cases the factor (mean and maximum pressure) averaged 0.94 instead of the normal 0.73, showing that the capillary circulation had a low pressure.

In mania it was difficult to obtain an observation without exciting the patient; but in a few cases observed I found both the mean and the maximum pressure very high, the maximum being high in proportion to the mean; the factor, mean and maximum pressure, being about 0.64 showing that the circulation was rapid, and that a very large volume of blood was passing through the system. In mania with depression there is a high mean and high maximum pressure; but the ratio is about normal.

In locomotor ataxia and paresis the mean blood pressure is high. In three cases of locomotor ataxia I found:

| Pulse | Mean P. | Max. P. | Factor. |
|---|---|---|---|
| (1) 95 | 180 mm. Hg. | 220 mm. Hg. | 0.82 |
| (2) 86 | 172 mm. Hg. | 210 mm. Hg. | 0.81 |
| (3) 92 | 188 mm. Hg. | 220 mm. Hg. | 0.88 |

In paresis the results were about the same except in one case where the patient was melancholic when the pressures were about normal.

In arterial sclerosis, owing to the hardness of the vessel walls, the instrument gives much too high results for the maximum pressure, but the mean pressure is probably correctly registered and is, as would be expected, high.

There is a condition of nervousness which is often met with giving a history of long-continued worry, excitement, mental strain or suppression of the emotions, in which the maximum and minimum blood-pressures are very high but in proportion, the factor being about 0.73, and in which there is apparently no dilatation or hypertrophy of the left heart, but a distinct dilatation of the right heart with venous congestion, the proportion of venous blood to arterial blood being above normal with a dry, harsh skin and evident defective capillary circulation. In such cases the continuous mental strain, acting as all emotions do upon the circulation, contracting the vessels, has produced a spasmodic contraction of the arteriolar muscle. As these cases improve under treatment the pressure returns to normal.

From the clinical standpoint, the observation of the maximum and minimum blood-pressures and their relation to one another is of immense advantage, not only as an indication for treatment but also as a measurement of progress.

The treatment of the condition of the mean pressure is generally far from satisfactory, none of the vasodilators of the pharmacopœia giving satisfaction; amyl nitrite is too fugitive to be of any value except in emergencies; nitroglycerin, though more lasting in its effects, has the defect that it accelerates the heart, and further, I have never been able to reduce the pressure more than 10 mm. Hg. with doses of gr. $\frac{1}{50}$, the effect passing off in about three hours; erythrol tetranitrate is not more satisfactory except that, owing to its insolubility, its effect will last six hours. The nitrates and nitrites of the alkalis are not reliable and in no way superior to nitric acid. The ideal drug in these cases should dilate the arterioles and not increase the heart beat, or better still, slow and strengthen it.

The suprarenal extract given internally does not fulfil these conditions perfectly; it undoubtedly slows the heart and increases the force in cases where the maximum pressure is low, and it will also increase the mean pressure, but it fails to increase the capillary circulation.

The thyroid reduces the mean blood-pressure by dilating the arterioles, filling up the capillaries, changing the dry, harsh, white skin, to a moist, soft, pink, normal condition, and, if pushed, will produce severe diaphoresis which none of the vasodilators referred to above will do; but it weakens and accelerates the heart, producing a condition of mental depression if pushed, which in neurotic patients is very undesirable. By the administration of arsenous acid and strychnine in very small doses the heart weakness and depression are somewhat relieved. If administered over a long period of time in small doses the thyroid gives good results in many cases, but as an emergency drug, where the relief of the patient is urgent, it fails.

The Shott bath treatment has given the best results. After immersion in the bath, the blood-pressure falls, the capillary circulation is improved, cyanosis of the extremities disappears, the volume of respiration is increased and the heart rate is decreased. How the simple bath of sodium and calcium chloride produces these results is not very clear. The most necessary factor in getting good results from this treatment is the temperature of the bath which should never be

lower than 96° F., and never above 101° F. If the temperature exceeds these limits the peripheral vessels are contracted and the object of the bath is frustrated. The salts in the bath act in the same manner as the carbon dioxide of the later series of baths by irritating the skin and thereby stimulating the capillary circulation.

As the abdomen is the great reservoir of the blood, it has been argued that the pressure of the water, augmented by the increased specific gravity, on the abdomen, increased the bulk of blood in circulation. In the experiments on animals it was shown that if held for a certain length of time in the vertical position, the blood would gravitate to the abdomen, the animal becoming comatose; but by simply immersing it in water, still in the vertical position, it would recover owing to the pressure of the water. But if this extra pressure were the cause of the phenomena of the Shott baths, simple pressure on the abdomen without the bath ought to produce the same result, which it does not.

The arterioles are the regulators of the blood supply to the capillaries, and consequently to the venous system; when they contract, less blood passes through them and consequently the capillary circulation is decreased. The contraction of the arterioles increases the blood pressure, which causes increased action of the heart, perhaps by forcing more blood through the coronary arteries. If the ateriolar contractions continue there is a damming back of the blood acting through the left ventricle on the pulmonary circulation, thence to the right heart producing an increase of the proportion of venous to arterial blood and a stagnation which must materially reduce the bulk of circulating blood. In such a condition a vasodilator would presumably remedy the condition which arises primarily from arteriolar contraction. If, however, the contraction was in the capillaries the vasodilating drug would have little or no effect.

The very large capacity of the capillaries causes any general contraction to have far-reaching effects on the circulation; though no nerves have been demonstrated in the capillaries it is evident that they have some means of regulating the amount of blood passing through them as on observing the capillary circulation in the mesentery the capillaries will be seen to obliterate and then to refill. It seems to me that many of these nervous conditions with increased mean blood-pressure are due to an obliteration of the capillary circulation which acts upon the circulation in the same way as arteriolar contraction. That the capillary circulation is affected by the emotions is shown by the blanching in fear, fatigue, etc., while Leonard Hill has shown how sensitive the blood-pressure is to the emotions, even working out a problem in arithmetic raising the blood-pressure 10 or more mm. Hg. The proper distribution of the blood to the various organs is probably of as great importance as the quality, and any condition which disturbs the distribution will be far-reaching in its effects.

## TYING AND CARE OF THE UMBILICAL CORD.

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This interesting and important subject seems to have been entirely overlooked in the numerous medical papers; and to bring before the profession the necessity of the management of this much-neglected subject this paper is submitted.

The tying of the cord, judging from experience, is performed incorrectly by half of the profession, the general technic being as follows: a ligature generally of silk or catgut, which is sterilized (?) is taken, and the cord is tied with an ordinary double knot, tying same by grasping ends of said ligature and pulling in opposite directions as hard as possible, causing great tension to be brought to bear not only on the knot, but on ligature and cord itself. Very often the ligature breaks, with the result of a defect in it and we then have a laceration of the cord. We try the same method again and probably succeed. On the other hand, silk cuts tissue when great tension is employed and we therefore do further damage. It is the practice of the author, and I think in all maternity hospitals, to use tape which is about one-sixth to one-eighth of an inch wide. This is cut into strips seven to eight inches long, giving plenty of room for tying. These strips are then put into a test-tube the end being plugged with cotton and over this a piece of linen is tied. This is then subjected to dry heat for thirty minutes. We then have a sterile and serviceable ligature. The tying should be performed by placing the first knot in place over cord, then drawing snugly, put thumbs in apposition, then, using the second joints of thumbs as a fulcrum, separate tips of thumbs holding the ligature. In this way pressure is brought to bear directly on the knot itself and the chances of breaking of the tape and of lacerating the cord is minimized. The tape is firm and does not cut the cord substances. There will, therefore, be no hemorrhage, which cannot be said when silk is used. The author has seen over 500 cases in which this method was employed, and has yet to see either hemorrhage or laceration of cord; and in 35 cases in which silk was used has seen 5 cases of laceration and as many hemorrhages. After the cord is tied take warm water and a little soap and wash the abdomen around cord gently, cleaning the vernix off, then dry thoroughly. Take a piece of sterile gauze four by four inches doubled and put in center of same a slit about one-half to one inch long. Through this pull the cord by the strings of the ligature, push gauze down onto the abdomen and place the cord on the gauze with it pointing upward; now fold the piece of gauze below up over cord, the sides over this and you have the cord enveloped in gauze and perfectly dry. Now cut the strings of your tape, you have not touched cord at all and as the cord is said to be sterile you have in no way infected it.

As regards the dressings to be used, powders, etc.; judging from the author's experience nothing but plain sterile gauze is the best dressing. There is no very serious objection, however, to powders, except that they leave a residue which hardens on the cord and on and in the umbilicus, necessitating cleaning of same, generally by the mother or some kind friend of the family, no attempt of asepsis being made and force in the majority of cases being used. The danger here is twofold, viz., injury of the umbilicus and infection. Ointments are worse, they leave a filthy surface and are splendid media for germs; alcohol used by many is good for only one reason and that is its hydroscopic power, but this is more than counterbalanced by its defects, which are first vesication and secondly, irritation. Alcohol is a vesicant and a great irritant to the delicate skin of the infant, setting up in quite a few a dermatitis which will necessitate further treatment. Again, powders, ointments and alcohol will not cause the falling off of the cord any sooner than plain dry gauze and you do not run the risk of infection, as with the plain dry dressing you can leave the dressing on until the cord falls off, and one may then be sure that there is a clean surface.

On summarizing, we have lessened chances for infection, and a falling off of the cord as soon, if not sooner, than by other dressings, against an accumulation of hardened masses of powder and of salves, or a dermatitis, and a greater liability to infection. From this summary the reader is left to choose which will be of advantage not only to his patient but to himself.

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## THE GENERAL PRACTITIONER AND HIS RELATION TO EARLY SURGICAL OPERATIONS.*

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In these days of ever-increasing specialism, it is not to be expected that the general practitioner or internist should be perfectly informed as to the refinements and minute developments in each special branch of practice. There are many points, however, in which he comes into close touch with them all, and in which his judgment may be of the highest importance to the welfare of the patient. There are so many patients applying to the internist at first for relief, who require at an early period expert surgical intervention, that it has seemed to me that the subject of the relation of the general practitioner to early surgical operations, was well worthy of a brief consideration by this section. I will premise all I have to say by the remark that all the surgical work referred to is supposed to be in thoroughly competent hands. It is always too early for unskilled or incompetent persons to undertake work requiring the highest technical skill, knowledge or experience, and such operations in such hands serve only to bring disaster to the patient and opprobrium upon surgery. Fools should not be allowed to rush in where "angels fear to tread," whatever may be their license or motives for so doing. But all of this, while an intensely practical matter, indeed a matter having to do deeply with medical education and medical ethics, has nothing to do with the scientific aspect of the subject under consideration. It is constantly impressed upon us by every-day experience that a very large number of cases are rendered hopeless or fail to be benefited as much as might be, by failure to secure surgical intervention at an early period. Valuable time is often frittered away by futile attempts to apply internal remedies to conditions requiring early treatment by the surgeon in order to secure favorable results. Here the general practitioner is so often the arbiter of the fate of the patient, for it is to him that such patients first apply for relief and it is only through his advice and aid that surgical aid is likely to be had. A few of the instances in which it should be his duty to promote the procuring of such early aid and it will be of interest and importance to consider.

The first condition to be considered in which a surgeon should be called early is that of appendicitis, or cases in which a diagnosis of appendicitis is probable. In my mind it is beyond question that appendicitis has been proven both clinically and pathologically to be essentially a surgical disease, and that it is dealt with by surgical methods with better results, both immediate and remote, than by purely medical management. This being the case it is certainly unjust to the patient and to the surgeon to delay associating him in the treatment to a time which might not be best or most desirable for operation. An early diagnosis and early operation, I believe, is supported by the consensus of opinion of those having the widest experience in the treatment of this disease. An early diagnosis is usually not difficult. A localized peritonitis in the right iliac region in males and children is in the vast majority of cases of appendiceal origin. In women the differentiation from a cause originating in the female pelvic organs is usually not hard to make by the usual methods of examination of those parts. The futility of medical treatment in a large number of cases is shown by the disastrous termination of many of them apparently of mild type. There may be at first severe pain soon becoming bearable, a temperature not exceeding 101.5° F. and pulse 100, there may be no inflammatory mass and everything may point to an early recovery, when on the third or fourth day a perforation may occur from gangrenous appendix and the patient soon collapses from septic peritonitis. As Nothnagel has well said, unless one operates early, by principle, in every case, such results cannot be avoided occasionally. The rule laid down by Hemmeter[1] in his work on "Diseases of the Intestines," should, therefore, be followed wherever possible. He says "Let the practitioner associate an experienced surgeon with himself in every case of appendicitis, even

* Read before Illinois State Medical Society, April 29, 1903.

the simplest and mildest." In intestinal occlusion the same rule holds, so that no valuable time should be lost in attempting a cure by purely medical methods. Favorable results are much more likely to follow early, than late operations. According to statistics compiled by Naunyn of the results of 288 cases of intestinal occlusion treated by surgical intervention, when the operation took place during the first forty-eight hours the recoveries were 75 per cent. After the third day the results grew less favorable, sinking to 35 per cent.

Nothnagel, Boas and Naunyn all agree that when the character of the occlusion can be well made out, medical treatment should not be continued longer than forty-eight hours. Hemmeter thinks that "the obscure cases running an intensely acute and rapid course, should be *operated on at once*. These cases usually being so very fatal without operation that every life saved in this manner is a gain and a gift, pure and simple." Acute cholecystitis not rapidly subsiding is another condition in which surgical advice and frequently early surgical operation is indicated. Kehr,[2] whose experience in the surgery of cholelithiasis has been greater than that of any living surgeon, emphasizes the importance of operation before the pathological changes in the gall-bladder have not advanced too far, and while the gall-stones are still in the gall-bladder, not having moved into the deeper ducts. He says "*the slight dangers of early operation stand in no sort of a relation with the great dangers of the disease itself*. This conviction ought more and more to gain strength, and not only in medical circles but even in the lay public to gain a firm footing. It is very lamentable that the scientific practitioner has scarcely any opportunity of influencing the wider circles of the people, for just as soon as he opens his mouth in any sort of a society not a medical one, he is exposed—often, indeed, with reason—to the charge of advertising. The natural doctor and the empiric, however, scatter the poison of their teaching ever further, and we are obliged to connive at stupidity and folly gaining always more and more."

The cases which may be safely left to the internist are cases with acute obstruction of the common duct proceeding normally, and those with frequent colics each time attended with the passage of stones. But cases of seropurulent cholecystitis and pericholecystitis with adhesions, and cases with chronic obstruction of the common or cystic ducts, should certainly be cases for skilled surgical interference as early as possible. According to Kehr's experience, the mortality of these operations is less than 1 per cent., while not over 90 per cent. of the cases show even an apparent cure under medical treatment.

In perforation of a typhoid ulcer in the course of typhoid fever, the only hope of saving the life of the patient lies in the earliest possible operation. After the shock of the perforation is over, every hour the infection of the peritoneum becomes more intense, and as Keen says "*if the operation is not done within about twenty-four hours after its occurrence there is practically no hope of recovery.*" Early diagnosis and prompt operation is the keynote to any success here. As J. B. Murphy,[3] of Chicago, has recently said in his report of a case of typhoid perforation operated on by him last November with favorable results, "In the past the diagnosis of perforation was based on the combination of symptoms included under the term collapse, which he believed to occur a few hours after the perforation took place. At present the diagnosis of acute infectious perforative peritonitis is based upon the symptoms of pain, nausea, and vomiting, localized tenderness, circumscribed flatness on piano percussion, and hyperleucocytosis, in the order named."

An operation should not be postponed until collapse symptoms appear. In a contribution of "Surgical Features of Typhoid Fever," in the last volume of Johns Hopkins Hospital Reports,[4] the authors, McCrae and Mitchell, say that it is the practice in that hospital to have a surgeon see all cases of typhoid fever presenting any abdominal features, following a suggestion previously made by Osler that the earliest symptoms of perforative cases should be studied and watched by the surgical colleague as well as the physician. Out of seven cases so studied and operated on in the hospital within the last two years, two have recovered. In one of the cases with favorable result, the operation was made within seven hours after the first appearance of localized abdominal pain and rigidity, but before the appearance of any marked distention. In the second favorable case, the operation was made twelve hours after the first appearance of abdominal pain and rigidity, and about four hours after distention first appeared.

Cases presenting indications of extra-uterine pregnancy should have surgical advice, and often surgical operation at a very early period, and as these cases, as well as the other types previously considered, first come into the hands of the general practitioner, upon his judgment frequently depends the fate of the patient. Whenever a woman, having passed one or more menstrual periods and supposed to be pregnant, is suddenly seized with severe pain in the lower abdomen, feels faint and develops symptoms of shock, as pallor, feeble pulse, clammy sweat, cold extremities, etc., it is probable that she is suffering from hemorrhage from rupture of the extra-uterine gestation sac. It goes without saying that a competent surgeon cannot see her too soon, and neither expectancy or stimulating medication should be relied on. These are cases where early or immediate operations are frequently life saving. Early operative interference is indicated in septic infection of the uterine appendages. In an address on this subject, Henrotin[5] well contrasts the two courses which may be pursued. The method of delay, in which he says "you see your patient regularly, hypnotize her to the best of your ability, amuse her with poultices and hot

douches, give her quinine as an antipyretic if her temperature goes up, or quinine as a tonic if it goes down, and tell her to have patience, and if she does not recover, when her tubes and ovaries are ready and ripe, yourself or one of your friends will remove them." Or, as early as you find an exudative mass against the uterus, and the organ fixed, incise the posterior vaginal fornix and drain the affected seat of the trouble.

While not necessary to the saving of life, the general practitioner should advise more often and more decidedly than he does the early operation for the radical cure of hernia. When the almost entire absence of mortality of the operation in competent hands is considered, and the result in removing completely what is otherwise a most distressing disability, the only wonder is that it is not advised as a matter of routine in all patients capable of tolerating any surgical interference, between the ages of five and sixty years. This has been my invariable practice for several years, and the results have been uniformly gratifying. Three years ago the late lamented Prof. Christian Fenger performed the Bassini operation for me, for the cure of a herna acquired by me one week previous, and the result has been a permanent cure. The precentage of recurrences in operations properly done is extremely small. I know of no surgical procedure giving more satisfactory results, and its early performance should be much more common.

Accumulations of fluid in the pleural cavity should be removed promptly by aspiration under aseptic precautions, and such patients not subjected to the prolonged disability produced by waiting for results from internal medication. Delafield,[6] in a recent article on "The Treatment of Pleurisy with Effusion" details 200 cases treated in his service in Roosevelt Hospital from 1886 to 1901, all of which were aspirated. There was infection in no case and the patient usually made complete recovery within two weeks. In private practice his results have been still better, a number of them being entirely well within a week, and none of them sick longer than two weeks. With such results as these by aspiration, how unnecessary seem the long delays incident to courses of medical treatment, and reserving aspiration as a last resort for effusions which seem to menace life. The experience of Dr. E. Fletcher Ingals[7] is that where aspiration is done early in empyema, we may expect from 95 to 98 per cent. of recoveries. Early aspiration is to be advocated in effusions of any size into the pericardium. I have seen more than one patient die where this was refused, that I am confident might have been saved by its timely performance.

Carcinoma affecting certain portions of the body is only amenable to early operation following early diagnosis, this being particularly true of the mammary gland, the uterus and the rectum. The recurrences which follow later operations are disheartening to the surgeon, and only tend to lessen the confidence of the people in surgical art. In his monograph on "Diseases of the Breast" Bryant[8] says that the only hope of cure lies in early diagnosis and radical removal. "Waiting till symptoms develop" means waiting till all hope of cure is gone, he thinks, and Senn[9] in his classical work on "Tumors" says: "The writer is confident that when the public has become educated in reference to the necessity of early operations, and the profession recognizes the importance of carrying the incisions far beyond the palpable tumor and the infected glands, the percentage of permanent recoveries will be increased greatly." In this view all surgeons heartily concur, and the duty of the general practitioner is most plain. As the adviser of his clientele on matters pertaining to their health, he should make known to them the importance of seeking professional advice at once in any abnormality or induration occurring in the mammary gland in women above forty years of age. The importance of this can be still more fully realized when we consider that 85 per cent. of all growths appearing here are malignant in character. Only through this means of educating the public will these cases be brought to the attention of the surgeon when his aid will be most effective.

Rectal troubles causing obstipation should very early be subjected to a thorough rectal examination. If this were done habitually very few cases of carcinoma of the rectum would be permitted to go to the inoperable stage. As it is, most of the cases, when referred to the specialist, have passed beyond the period when surgical operation would be justifiable. Hemmeter says that 90 per cent. of the cases of malignant disease that have come under his observation, have brought the ready-made diagnosis of bleeding piles or fistula. In carcinoma of the uterus the same complaint is to be made. Hitherto, statistics relating to ultimate recovery have been most discouraging. At the Ninth German Congress of Gynecology, May 29 to 31, 1900, Prof. Freund said he was able to report only two cases of cancer of the uterus permanently cured by surgical operation in twenty-three years' experience. He learned by inquiry in the various clinics of Germany that after abdominal extirpation with removal of the larger portion of the parametrium and glands that the mortality is 24.5 per cent., and recurrences within the first year 46.6 per cent. Baldy[10] in a paper read before the Gynecological Section of the American Medical Association in June, 1901, expresses the view that the results achieved by surgery in this disease are "surgery's disgrace." He estimates that the number of permanent cures following operation is less than 5 per cent. These bad results he attributes to lack of proper attempt to discover these cases early, and a disinclination to advise immediate operation when they are discovered, under the misapprehension that a later operation saves a large percentage of cases. He says that when the family practitioner realizes that early operation gives the only hope of cure, he will watch his female clientele more closely with this end in view. Hemorrhage with possibly beginning loss of flesh and strength is, he thinks,

the diagnostic sheet anchor in the early stages. Bleeding begins very early—early enough to give warning of what is coming. A woman who has passed the menopause, and a year or two, or possibly several years later has a show of blood from the genitalia, almost invariably has uterine cancer. He would be suspicious of any hemorrhages occurring without reasonable cause. These at any time may be significant, and call for careful examination. The symptoms may be explained by polyp erosion, or a benign ulceration, but most frequently will cancer be found so early that the pathologist will be uncertain in his diagnosis. The earliest possible operation is the only way of making a better showing in our number of cures, and for this opportunity the surgeon must depend on the wisdom of the family practitioner in making an early diagnosis and advising immediate operation.

Dr. G. Frank Lydston[11] has recently called attention to the fact that the profession at large should be impressed with certain facts in regard to prostatic enlargement. He called attention to the fact that while the use of the catheter may for the time relieve the symptoms of prostatic obstruction, that the longevity of patients after the habitual use of the catheter has been once begun, is, on the average, about five years, and those five years, years of suffering. It is obvious, therefore, that, when the enlargement and obstruction have reached this degree, the case must be referred to the genito-urinary surgeon. An early operation performed before the onset of bladder and renal complications gives a favorable prognosis, and should always be advised at this time. The operation done at a later period, as I know from observation of several cases in which prostatectomy has been done as a last resort, after the obstruction had become so great that a catheter could no longer be used and the bladder and kidneys had become affected, is not satisfactory, and the results are only palliative.

A considerable number of conditions in which delayed operations are undesirable might be mentioned, but I will close with a few in which the family practitioner is the determining factor in bringing about early relief. One is the early removal of postnasal adenoid growth, in which delay is, in most instances, fraught with evil consequences, not only on the general health, mental development, and facial formation, but also from the danger of ear complications arising, and the greater seriousness of infectious diseases, such as scarlatina and diphtheria, in such subjects. Another condition in which timely interference is desirable is in acute purulent collection in the middle ear, in which an early incision of the tympanic membrane may prevent the extension of the disease to the labyrinth or meninges.

This list might be almost indefinitely extended, but enough has been said to show at how many points the general practitioner comes in contact with the surgeon and specialist, and to demonstrate the importance of his having carefully considered opinions regarding the pathology and treatment of many affections which very early demand operative care.

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## OTHER CAUSES THAN SYPHILIS FOR PARESIS.*


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So much has been written on the subject of general paralysis of the insane, and yet we know so little of its pathology, I necessarily feel some timidity in presenting this paper, though the thoughts and experiences I relate have been worked out by mental struggles and energies extending over a period of six years, and I feel that these observations are worth repeating, at least for consideration and judgment.

One hundred years ago there was very little thought about this fatal form of mental trouble recognized as paresis; in fact, as late as thirty years ago, very little was written about it in medical literature. So it can now be considered a disease of modern civilization, especially confined to busy commercial and crowded cities. The increased percentage, as will be shown in the following statistics, and with it the recognized fatality of its termination, should attract the attention of the profession to active investigation. I was prompted to present these views from a consideration that the theory of paresis, being due to syphilis mainly, was a stumbling-block, liable to produce many blunders in the effort to discover some curative treatment of this form of mental disease, impeding and discouraging the profession in their hopeful search of a cure for paresis, and a possible preventive line of advice to susceptible cases.

My own observation has impressed me with a determination to search earnestly for the causes of this disease, and in this search I find that records from every hospital and asylum that has furnished statistics show it to be a disease of the prime of life, and is most prevalent at the age of forty-five years. All reports show the minimum susceptibility of age to be twenty-five years, increasing to the age of forty-five years and decreasing again to the age of sixty years, showing conclusively that it occurs at the period of greatest mental activity and is discouraging to the idea held by some of the profession that syphilis was the only cause for paresis, as the ages of twenty-five to thirty-five is the most common period for contracting syphilis.

* Read at the Fifty-third Annual Meeting of the American Medical Association, before the Section on Nervous Disease.

I do not doubt for a moment the statistics that there is a history of syphilis showing in a large percentage of cases of paresis, but think that it is the result of mental agony and worry that produces such mental strain as to cause the disease instead of the effect of syphilitic poison on the brain cells. As a proof of this I refer to the reports in medical literature of the countries of Japan and Egypt, where syphilis is very prevalent and paresis is scarcely known. This can be explained better by recognizing the fact that these people have very little mental worry and are low in the scale of modern civilization. The most convincing argument, however, to my mind is found in my own experience in the treatment and observation of this disease in the four years service as First Assistant at the Western Kentucky Asylum, where there was quite a large percentage of the colored race treated, and I did not find more than two per cent. of paretics, while among the whites it reached 18 per cent. Yet, we know that among the colored race syphilis is the most prevalent. This can be accounted for only by the absence of mental worry in the colored race.

These facts in addition to the rapidly increasing percentage of cases, as shown at the present, shows very conclusively that the theory of "No syphilis, no paresis" is not correct.

In referring to other causes than syphilis for paresis, I wish to be understood to mean the effect of the syphilitic poison on the brain cells or nervous system necessary to cause the organic changes produced by this disease necessary to result in paresis. I take it that the mental worry and distress of mind is independent of the disease, for you can satisfy the patient's mind of a permanent cure and assure him of no recurrence in the future, thereby saving him from being a paretic. In the same way you would stop a business man from the strain of his mental labors.

There is a recognized specific for syphilis and why should not paresis in its early stages, when due to it, yield to the constitutional treatment and result in recovery. This is not too much to expect of a specific treatment in any disease. Syphilis has existed for more than 1,000 years, and I am sure the old, acute observers would have discovered paresis had it existed to any great extent in the early ages, for the mortality in paresis is appalling in all the statistics examined by me. In Kraft-Ebing's Clinic, Dr. Asher and Dr. McDonald of Manhattan Hospital, and many others, only one case of recovery is recorded, and yet an increase of 75 per cent. in the last twenty years is shown. There must be other causes than syphilis for paresis. Out of 123 cases that have come under my care 87 had no history of syphilis, and, I am convinced, never had the disease.

The percentage of paresis as compared between male and female is ten to one and syphilis four to one. Mendel shows that in 1876 the percentage of paresis in agricultural districts of Schleswig-Holstein and others was $4^{5}/_{10}$ per cent. while in Berlin it was 26 per cent., an indication that specialties in cities and the concentration of mental energies to one single vocation or single strain of thought should be classed as prevailing causes for this disease. I believe that statistics will show that one in every ten among the insane are paretics. If this is true I feel that a close inquiry as to the causes of paresis should be inaugurated by the profession and a careful scrutiny made of the failing health of a complaining business man among our patrons. The fact that it is fatal in the average cases in so short a period, one to two years and often earlier, should make us look to the sources that produce this fatal form of disease and search out the early symptoms with the information that we can gather as to the causes rendering an earlier diagnosis possible.

General cerebral strain, irregular eating and sleeping are the prevalent causes. This includes any mental worry that is kept secreted in the mind of the individual, such as brooding over financial failures or imaginary troubles that excite the mind and produce mental agony, as in the case of a man who has contracted syphilis that has listened to a lecture from a semimedical professor on the horrors of syphilis, producing in the individual all the mental horrors that the loathsome disease is associated with, making them become extremely observant of themselves; every little pimple about their body or face they attribute to the disease and think they will have facial manifestations of the disease to stamp them as syphilitics before the world, or decide in their minds, in case they marry, their children would be deformed and miserable beings. No wonder they terminate in paresis.

If such demagoguery in medicine could be stamped out and in its place a cheerful assurance of recovery from this disease, we would have fewer paretics. The medical profession is to blame, in a large degree, for these impressions on the laity. We find among the insane syphilitic manias that are not attributable to the influence of the disease on the constitution, but to the impression on the mind of the dreaded results of the disease. These cases only differ from the paretics in the temperament of the individual. If the former, one talks to every one and listens to him, and in the latter all the worry and agony of mind he keeps to himself and broods over it.

So I am persuaded that civilization brings in its wake an increased percentage of this disease.

Sexual excess and alcohol should not be omitted as prevalent causes of this disease, for I am sure they are recognized as important factors, and in the same way exaggerate the physiological functions of the brain. The central excitement of the sexual excesses produces a hyperemia of the brain. Alcohol does the same. So does any form of mental strain, a continuation of which frequently will produce paresis. We can take a remedy that will produce a hyperemic condition of the brain and produce paresis.

I have kept syphilis continually before me in this paper, because I think it stands at the head of mental worries and anxieties. The earnestness

with which I have gone into this paper can only be excused on the grounds of my having exerted every therapeutic means I possess to restore a few patients in whom I recognized the trouble early, but without result.

I am convinced that neurotic elements are important factors in the majority of cases. Next to this element comes the extremely sensitive, whose thoughts and acts are controlled in a great degree by the manners and acts of their friends, bringing upon them mental worry over imaginary wrongs, etc.

Actors, playwrights, inventors, commercial men and bookkeepers—all such individuals as have sensitive natures should be observed closely, for they are usually the victims of this disease. As an example, one of the most popular artistes of the American stage, whose character is as pure as our ideal of modern womanhood, whose peace of mind was destroyed by a single breath of slander which sent her to an asylum. I call to mind one individual, a lawyer, who stood in the front rank of his profession, but the sensitiveness of his nature drove him from the bar, his sensitiveness increasing until his imagination kept him in an angry sea of torture, unbearable to a human being, which resulted in a complete giving way of his mental forces.

I am justified in concluding as follows:

1. That syphilis is present in a large percentage of the cases of paresis.

2. That it is certainly an important factor in disturbing the peace of mind in a susceptible and sensitive individual, whose pessimistic tendency is hereditary.

3. That in the majority of cases where syphilis is present, the mental worry and nervous strain keeps the brain in a state of hyperemia, causing loss of sleep and appetite that results in paresis, in the same way that any other mental worry will precipitate this disease in a susceptible individual.

4. The prevailing cause of paresis is an overworked mind in centralizing the mental energies without relaxation, whether worry over financial troubles, syphilis or a concentration of the mental forces in any single avenue of life.

## MEDICAL PROGRESS.

### HISTOLOGY, PATHOLOGY AND BACTERIOLOGY.

**Hemoagglutination of Human Blood.**—This phenomenon has been studied by U. Biffi (Ann. d'Igiene Sper., fasc. 11, Year 1903) with the view of determining its applicability to clinical diagnosis and medical jurisprudence. His investigations were carried out with 140 individuals; 100 of whom were apparently healthy and 40 were afflicted with various diseases, such as malaria, pneumonia, typhoid, etc. He found that the blood or serum of a malarious subject had the power to agglutinate the blood of another malarious subject and also healthy blood; this finding coinciding with that of Lo Monaco, Panichi, Grixoni and others; but the author believes the phenomenon to be of little diagnostic value in latent malaria, from the fact that it is present in many morbid conditions as well as in normal serums; a higher agglutinating power having been found by him in two normal specimens than in the serums of diseased conditions. Ascoli's statement that normal blood has the power—though feeble—to agglutinate its own cells was not confirmed in Biffi's work. On the other hand, he found that this power was present to a high degree in diseased conditions; for example, in a febrile malarial seizure, the first stage of pneumonia, etc. That the phenomenon of autoagglutination was in no way related to that of coagulation, was amply proven by the author's work. The relation between the agglutinating power of the serum and the agglutinability of the red cells was carefully studied by the writer; as a result of which investigations he lays down the general rule that in normal human blood, the agglutinating power of its serum is in inverse ratio to the agglutinability of its red cells. The greater the agglutinating power of the serum, the feebler the agglutinability of the cells. Pathological blood exhibits, as a rule, the same characteristics, but a certain number of exceptions to the rule were seen by the author in diseased conditions; and he found that the agglutinating power of the blood-serum in a given individual might be quite different from that of exudates and transudates occurring in the same individual. Biffi believes that the differences in agglutinating power of the serum in different individuals, as well as the difference in agglutinability of their red cells may be utilized in medical jurisprudence. For example, in a case in which it might be necessary to decide from which one of several individuals a blood spot is derived. This he believes may be determined in the following manner: By means of the usual technic applied to legal medicine, the red cells should be extracted from half of the blood spot and suspended in a small quantity of 0.85 per cent. NaCl. A drop of the blood-serum from the suspected individual should then be mixed with this emulsion of red cells. If the former show high agglutinating power toward the latter, the blood spot is not derived from that individual; for it has been shown that the serum of normal blood will not agglutinate its own cells. If the extraction of the cells from the spot is not possible or if they are too deformed for use, the serum may be extracted from the other half of the spot, and this used to test its agglutinating power toward the red cells of the suspected individuals. These same tests may be applied when it is desired to learn whether a number of blood spots are derived from the same individual. In the author's belief, a small specimen of blood from the body of any individual who has met death by violence, should invariably be preserved for use in such legal examinations. Much of the value of the medico-legal application of agglutination phenomena depends upon their constancy. This the author has investigated and has found that in a period of from three to four months there is but very little variation in these phenomena in a given individual and this variation is only such as might be attributed to faulty technic. He also found that blood spots retain their agglutinability and agglutinating power for a prolonged time.

**Sputum as a Culture Medium for Tubercle Bacilli.**—Following up the work of other experimenters along this line, G. Guyot (Gaz. Osped., July 5, 1903), has made a series of experiments to determine the value of the sputum as a culture medium for the tubercle bacillus. He describes the technic as follows: The required amount of fresh sputum, free from extraneous matter, is collected and allowed to digest upon the water bath from eight to ten hours; after which it is filtered while hot and sterilized for three-quarters of an hour, when it is again filtered. The filtrate can now be used for cultural purposes, in the liquid state or incor-

porated with agar to render it solid. The proportion of agar should not be more than one per cent. With the liquid sputum, the author obtained excellent homogeneous cultures which could be used after ten to twelve days and these he considers not inferior for use to those prepared after the methods of Arloing and Courment. In the combined sputum and agar, the development of tubercle bacilli is promptly evident. Within twenty-four hours proliferation of the bacilli may be recognized in cover-glass preparations made after the method of Hesse; and rapid growth of colonies may be seen with the naked eye upon the third day. The colonies are white and opalescent, their appearance differing in this respect from ordinary glycerinated agar cultures. The author holds that the simplicity and economy of the preparation of this culture medium should favor its general adoption in laboratory work, and further, that these studies serve to emphasize the necessity of disinfectant and astringent treatment in catarrhal affections of the respiratory passages.

**Effect of the Nucleoproteids of Heterogeneous Blood on the Red and White Cells.**—Certain dangerous signs having been observed from the transfusion of blood, various hypotheses have been advanced concerning the mechanism of the pathogenic influence upon the organism, exerted by the blood of an animal of different species. The effect of the nucleoproteid of parenchymatous tissues upon the morphology of the blood and upon the mechanism of coagulation has been noted by many observers. G. GUERRINI (Gaz. Osped., July 5, 1903) has sought to determine the effect of the nucleo-proteids of the blood of healthy animals upon the number and proportion of red and white cells in the blood of an animal of different species. For this purpose, rabbits were injected with the nucleoproteids of dogs, chickens and eels; the nucleoproteids being extracted by Woodridge's method. The author found that injections of a one-per-cent. aqueous solution of sodium carbonate had no apparent effect upon the number of red cells, but a slight increase in the leucocytes followed such injections. Injections of a one-per-cent. solution of nucleoproteids heated to 60° for thirty minutes had practically the same effect as injections with plain sodium carbonate. Injections of the nucleoproteids of rabbits slightly increased the white cells, though they failed to affect the red. Injections of a one-per-cent. solution of the nucleoproteids of heterogeneous blood (dogs, chickens and eels) in one-per-cent. sodium carbonate diminished the absolute and relative number of red cells and increased the white both absolutely and relatively.

**Symbiosis of the Influenza Bacillus.**—The possibility that symbiosis with certain invisible bacilli may be an important factor in prolonging the life of the bacillus of influenza, is the statement made by M. NEISER (Dert. med. Woch., No. 26, 1903). He bases this on the fact that he has been able to cultivate influenza bacilli through some twenty generations, which were derived from a case of measles conjunctivitis and were associated with xerosis bacilli. In every case the influenza bacillus died out unless this symbiosis with the xerosis bacillus was kept up. It is suggested that the latter may have modified the agar-agar, which was the medium used, in such a way that it was rendered more favorable for the growth of the influenza bacillus. The author also found that the diphtheria also served as a "nurse" for the bacillus of influenza, but not so successfully as the xerosis bacillus.

**Sedative Treatment of Hyperchlorhydria.**—In the examination of the gastric secretion of patients exhibiting the symptoms of hyperchlorhydria, G. CAMPO (Rev. de Esp. Méd., June 20, 1903) has not infrequently found the acidity to be normal; and in many patients in whom symptoms of this condition subsided after treatment, he has found the acidity as high as before treatment was instituted. Hence he believes that the discomfort experienced by this class of patients is largely due to hyperesthesia of the gastric mucosa toward hydrochloric acid. He therefore treats his patients suffering from so-called hyperchlorhydria with sedatives, and has obtained the best results from menthol 0.50, cocaine hydrochlorate 0.50 and alcohol 10 c.c. Each drop of this preparation represents 1½ milligrams of menthol and cocaine respectively. The patient experiences great relief from five or ten drops of this solution given at the onset of distress, and the relief is of longer duration than that obtained from alkalies. The dose is gradually diminished after a few days and dropped altogether after subsidence of symptoms. A permanent cure is sometimes effected with this treatment, but the symptoms may return after a time as they do when other remedies have been used.

**Anastomotic Circulation of the Heart.**—An interesting condition of the heart was discovered at an autopsy by G GALLI (Münch. med. Woch., July 7, 1903). Though the right coronary artery was entirely obliterated, the parts of the heart supplied by it were normal, while with patent left coronary a sclerotic patch was found in the walls of the left ventricle. By careful dissection of the vessels, an anastomotic branch was discovered which ran from the intact left coronary to the right below the point of occlusion, thus permitting of a circulation in parts of the artery which otherwise would have atrophied. This case illustrates well that the heart, like other organs, possesses a power of adaptation to pathological changes whereby its function for a long time at least, is not interfered with, provided only these changes are not sudden in their development.

**Pseudo-tuberculous Bacilli.**—That the means of distinguishing the true from the pseudo-bacillus of tuberculosis are not always reliable, is shown by the following case, reported by R. MILCHNER (Berl. klin. Woch., July 20, 1903). In a patient, who had suffered from numerous hemoptyses, a physical examination showed the presence of a localized area of pulmonary dulness, bronchial breathing and small vesicular râles. Examination of the expectorations showed acid-resisting bacteria, closely resembling the true tubercle bacilli and leading to the diagnosis of a pulmonary tuberculosis. Against this supposition appeared the good general condition of the patient and the rather unusual site of the area of dulness over the lower lobes. Inoculation experiments on animals proved negative. Later on the expectorations assumed a very fetid character and the patient finally died from exhaustion no doubt induced by the loss of blood from the numerous hemorrhages. Autopsy showed an extensive bronchiectasis and a large bronchiectactic cavity, but no signs either macroscopic or microscopic, of any tuberculous process. The sections had been hardened in either formalin or alcohol, and no traces of any varieties of bacilli were found, although they were readily demonstrated in large numbers in the sputum before the death of the patient. The author accounts for the discrepancy by assuming that the staining properties of the pseudo-tubercle bacilli were entirely lost by the preliminary treatment of the sections with alcohol and formalin. He suggests that in doubtful cases, frozen sections should be examined and in order to avoid alcohol in dehydrating, the tissues should be imbedded in levulose.

**Detection of Blood in Feces.**—Stimulated by the recent theory that chlorosis is really brought about by constant slight hemorrhage into the gastro-intestinal tract, O. ROSSEL (Deutsch. Arch. f. klin. Med., Vol. 76, No. 6), suggests the following modification of an old

blood test for examination of feces: About 30 grams of feces are dried, powdered and freed of fat in the Soxhlet apparatus. The powder is then treated with glacial acetic acid, and shaken out with ether. By means of the usual guaiac or aloin test, hematin could then be readily detected in this ether. Care must be taken to use only fresh guaiac. A positive test was still obtained after the ingestion of only three cubic centimeters of blood. No food or drugs behave similarly except large doses of chloride of iron. The feces of a large number of chlorotic girls examined did not contain any more hematin than is normal, but as an aid in the diagnosis of ulcer or cancer of the stomach the test is invaluable.

## PHYSIOLOGY.

**The Enzymotic Decomposition of the Nucleic Acids.**—There are series of physiological and pathological conditions, according to T. Araki (Hoppe-Seyler's Zeitschrift, Vol. 28, Nos. 1 and 2), that lead to a dissolution of the substance of the cell-nucleus. This phenomenon is found in its widest application in the absorption of animal tissues; moreover, cells rich in nucleins and cell-products, such as the male sexual elements, can undergo normal dissolution, as has been demonstrated in the testicles of the brook-trout. The disappearance of the nucleus is not necessarily associated with the destruction of the entire cell, but may take place within the unchanged cytoplasm, as is familiarly seen during and after conjugation of the paramecia. The suggestion is strong that some enzyme affects the nuclear substance in the same way that pepsin acts upon albumin. The author found that the nuclear substance obtained from the red blood cells of birds, is rapidly dissolved by trypsin and that an extract of the thymus also contains an enzyme capable of slowly digesting the cell-nucleus. The thymus gland contains two forms of nucleic acids, namely, nucleic-acids *a* and *b*. The author discovered that trypsin is capable of splitting acid *a* with the formation as intermediate products of acid *b* and nucleothymin acid, which are further decomposed on prolonged digestion by means of trypsin. The extract of the thymus contains an enzyme which is capable of bringing about these identical changes. Erepsin, the peptone-splitting ferment of the intestinal mucosa, is also capable of splitting the nucleic acids. Moreover, in the auto-digestion of the intestinal mucosa, the constituent nucleic acid *a* is transformed into the more soluble acid *b*. Long-continued digestion of the mucous membrane results in a considerable reduction of the content of nucleic acids. Similar nuclein-splitting ferments were found in the liver and spleen. It is of peculiar interest that the nuclein group exhibits the same characteristics as the albumin and carbohydrate groups, namely, it exists in the tissues in an insoluble or colloid form, which under the influence of enzymes is transferred into a soluble form cast evidently also into smaller atomic groups.

**Transplantation of Submaxillary Gland.**—The investigation of the technic and physiology of organ-transplantation will probably bring to light many facts of practical value in medicine and surgery. D. Ottolenghi (Arch. Ital. de Biol., June 10, 1903), in transplanting pieces of submaxillary gland about the size of a pea, from one rabbit into the kidney or spleen of another, found that a large part of the transplantation suffered rapid death, only the peripheral portion remaining alive. In the former, with the exception of certain small portions, there is an early necrosis of the epithelium of the salivary ducts, the necrosed material falling into the lumen of the ducts, while the basket-cells remain alive, become infiltrated with fat and later undergo active karyokinetic multiplication, forming within the membrana propria at first one and later several groups of seemingly epithelial elements arranged in concentric circles; these finally block up more or less completely the cavities of the ducts. It is probable that in the formation of these cellular groups these participate to a slight degree with the epithelial elements of the intercalary canals, at the points where they are in connection with the salivary ducts. The cells of the acini can undergo multiplication when the glandular elements of the latter have suffered necrosis. In the peripheral portion of the transplantation, within the acini as well as the intercalary canals, there is a marked multiplication of glandular elements, which does not seem to lead to a new formation of acini nor of secondary canals, but which serves perhaps simply to replace certain destroyed elements, and to increase the size of the acinus the length of the intercalary canal. This proliferation ceases toward the eighth day, at which time certain retrograde changes take place even in the salivary ducts, which are transformed anew into canalieuli lined with a single layer of cells. The author has not been able to discover in the transplanted portions any new formation of solid epithelial growths such as these described by Lubarsch.

**The Physiological Action of Certain Phenanthrene Derivatives.**—It is generally known that morphine is derived from phenanthrene, a cyclic hydrocarbon having the symbol $C_{14}H_{10}$; the basic character of morphine being determined, like that of all other alkaloids by the presence of nitrogen. According to P. Bergell and R. Pschorr (Hoppe-Seyler's Zeitschrift, Vol. 38, Nos. 1 and 2) all the investigations that have so far sought to attribute the physiological action of morphine to single atomic groups, have been carried out almost entirely upon nitrogenous compounds related to morphine. The authors sought to determine to what extent the physiological action of morphine depends upon non-nitrogenous constituents, more particularly phenanthrene and its non-nitrogenous derivatives. They find that phenanthrene itself is quite inert, but that oxyphenanthrene or phenanthrol ($C_{14}H_9OH$) produces in mammals severe tetanic seizures. The position of the hydroxyl group in the molecule has no influence on the physiological effect. Similar symptom-complexes are produced by a carbon- and a sulpho-acid of phenanthrene. No narcotic effect was observed in this entire group. To what extent the effect of phenanthrol may be brought into relation to that of morphine which contains the phenanthrol-complex, and whether the behavior of this class of bodies affords any explanation of the tetanic components of morphine-action,—both of these questions the authors consider as still unanswerable. Substantially different from the action of phenanthrol and its carbon-acids, is that of derivatives of phenanthrene-equinone. These substances both in the test-tube and in the organism, show a decided power of forming methemoglobin, which power is to be attributed to the prepondering influence of the quinone-group. None of these compounds produces the above described tetanic state. Episin, a methyl derivative of phenanthrene, also produces methemoglobinemia. It is significant that in pigeons which show an extraordinary resistance toward morphine, severe toxic manifestations are produced by episin. Evidently there is some connection between the narcotic and other manifestations of morphine and the methemoglobinemia produced by some of its derivatives.

**Certain Constituents of Yeast.**—The internal administration of this substance in furunculosis and allied conditions, lends some interest to the research undertaken by O. Hinsberg and E. Roos (Hoppe-Seyler's Zeitschrift, Vol. 38, Nos. 1 and 2) on the constituents of ordinary beer-yeast. They find that this contains two

different forms of cholesterin, three different fatty acids, a colorless ethereal oil having the odor of hyacinths, phosphates, peptones, gluten-casein, purin bases, considerable quantities of albumin and cellulose-like compounds. As to the medicinal value of yeast, they find that living as well as dead yeast has a mild laxative effect, which is to be attributed to the fatty substance present. This fat was also found effective in certain cutaneous affections.

**The Effect of Alcohol upon the Excretion of Uric Acid.**—In a series of metabolism experiments, and hourly period experiments in which the urine was collected each hour during the day, S. P. Beebe (Proc. of the Amer. Physiol. Soc., Amer. Jour. of Physiol., July 1, 1903) found that the use of 75 to 80 c.c. of absolute alcohol contained in diluted alcohol, whisky, beer and port wine, produced in all but one individual a marked increase in the uric acid excretion. The increase began in most cases in the second hour after the meal and reached the highest point at the fifth hour. In the experiment where 50 c.c. of absolute alcohol, suitably diluted with water, were taken without any food after the usual period of fasting, a very marked diuresis was produced, but a decrease in uric acid was noted. This indicated that the effect produced is due to a disturbance in the metabolism of the purin bases of the food.

**Experimental Contribution to the Physiology of Fasting.**—The effect of prolonged fasting in dogs upon the functional activity of various parts of the gastro-enteric canal, and upon the anatomical elements of the thyroid gland, was studied by A. G. Barbèra (Archives Italiennes de Biologie, June 10, 1903) with the following results: The secreting fibers of the submaxillary gland contained in the tympanic nerve preserve their electrical excitability to the very last moments of the life of the fasting animal. An electrical stimulus of the tympanic nerve causes a marked, although less than normal, increase in the secretion of saliva. In this instance there are even periods of latent and survival excitation. The stimulation of the cervical sympathetic, on the other hand, produces frequently no secretion of saliva. The subcutaneous injection of pilocarpine augments the secretion of saliva, which is completely arrested by a subcutaneous injection of atropine. Curare injected into the veins increases the secretion. After the injection of pilocarpine, the stimulation of the tympanic nerve still further increases the salivary flow, while it cannot arouse this after it has been inhibited by the action of atropine. With the nerves remaining intact, a small piece of paper moistened with acetic acid and placed on the buccal mucous membrane, excites an abundant secretion of limpid, watery saliva. This secretion obtained in all the experiments above described, when chemically investigated, showed the absence of sulphocyanide of potassium, and by means of the test of artificial digestion, failed to reveal the presence of any diastatic ferment. This is not surprising inasmuch as it is well known that under normal conditions of feeding, the saliva of dogs, according to most investigators, contains no alkaline sulphocyanides, and, according to all workers, contains no ptyaline. The author found the same tenacity of function under conditions of fasting in the gastric secretory fibers of the vagus nerve, and the glandular cells of the mucous membrane of the stomach, although the gastric juice was reduced in quantity. It also contained very little free hydrochloric acid and pepsin. Intravenous injection of curare excited a secretion of gastric juice having the same character as that produced by stimulation of the vagus. The same relations were found with respect to the fibers of the vagus that preside over the pancreas, to the intrapancreatic nervous ganglia and to the secretory cells of the pancreas; the pancreatic juice obtained by the various means, retaining, although in a restricted degree, the power of transforming albumin into peptone, and starch into sugar. Upon histological examination, the author together with D. Bicci, found that in the case of the suprarenal glands there is a reduction in size of the cell-bodies and nuclei, the diminution of the protoplasm being greater than that of the nucleus. This phenomenon is more pronounced in the cortex than in the medulla. The same reduction in size of the protoplasm and nucleus were found in the thyroid gland. The latter, at no period in the fast, ceased to elaborate the colloid substance in which are supposed to be the active principles of the gland. There is also a diminution of intercellular substance. The nuclei diminish in size relatively less than do those of the suprarenal gland.

**The Fermentative Processes of the Liver.**—A research was undertaken by V. Ducceschi and M. Almagia (Archiv. Ital. de Biol., July 10, 1903), with the object of determining to what extent the presence and activity of the soluble ferment contained in a tissue, are immediately dependent upon the histological integrity of the cellular elements of the tissue; also whether the study of the enzymic activities of a tissue profoundly changed in its structural elements, would allow any differentiation between that part of the functional manifestations connected with the properties and integrity of the protoplasm as a cytological structure, and that part which depends, on the contrary, upon the presence of soluble enzymes in the cellular juices. Further, they hoped to determine in the special case of the liver, upon which the investigations were carrried out, whether the action of phosphorus, pushed to the point of causing the severest forms of degeneration, would modify the activity of the oxidizing ferment of this organ, and whether the absence of the oxidative processes, to which certain authors attribute the genesis of fatty metamorphosis of the tissues, can be explained, at least for the liver, upon the basis of an alterative of the activities of the oxidases contained in it. They obtained the following results: In a liver in which, as the result of phosphorus poisoning, considerable fatty metamorphosis has taken place, the activity of the oxidases is not diminished, at least in the beginning, in comparison with the normal liver. It can not, therefore, be admitted that the diminution of the oxidative phenomena of the organism, regarded by some authors as consecutive to phosphorus poisoning, can be attributed to a direct action of the poison upon the oxidizing ferments. There is no appreciable difference between the content of lipase in a fatty liver and that of a normal liver. The study of the functional capacities of an organ markedly changed in the intimate structure of its cellular elements, in the cases detailed above, serves to distinguish the enzymic activities from those bound up in the integrity of the structural elements. This is possible in taking account of the fact that the enzymes have no tendency, at least in the instance studied, of leaving cells which are the seat of intense necrobiotic processes. The proteolytic enzymes of the liver exert no apparent action upon the activity of the oxidases. In the case of old animals compared with young ones, the quantity of oxidases in the liver is found to be markedly diminished.

**The Biochemistry of Certain Nucleo-histones and Nucleo-proteids.**—The discovery by Lilienfeld that the nucleo-histon, obtained from the watery extract of the thymus by precipitation with dilute acetic acid, is capable, in the presence of salts of calcium, of transforming fibrinogen into fibrin, was the first of a series

of valuable data concerning the catalytic powers of these nuclear bodies. A. Herlitzka and A. Borrino (Arch. Ital. de Biol., June 10, 1903) report the results of their investigations of the problem as to whether the biochemical action of the nucleo-proteids is a general one for all these substances, or whether it is specific for each nucleo-proteid, depending on the function of the organ from which it is obtained. Lilienfeld considered nucleo-histon as the zymogen which, under the influence of the salts of calcium, is split into histon and nuclein, the latter inciting the coagulation of the fibrinogen and therefore revealing itself as the fibrin-ferment. Huiscamp showed that the nucleo-histon of Lilienfeld is not a chemical entity but is a mixture of nucleo-histon and nucleo-proteid, the former existing in the nucleus, the latter in the cytoplasm of the cell. He believed that these substances are the zymogens of fibrin-ferment, which is but the combination of calcium with the zymogen. The authors find that nucleo-proteids and nucleo-histones behave like acids. The nucleo-proteids alone and not the nucleo-histones have a destructive action on hemoglobin, which action is a general one for the nucleo-proteids of several organs. The nucleo-histon as well as the nucleo-proteid of the liver destroys glycogen; this action is a specific one and is not possessed by the nucleo-proteids or nucleo-histones of the thymus and kidneys. The results so far obtained lead the authors to conclude that the biochemic action of these nucleins is specific when the corresponding metabolic function of their parent organ is specific, and this action is general when the corresponding function is common to several organs. The authors were not able to cause the transformation of carbonate of ammonium into urea by means of these substances. In studying the possible glycolytic action of these substances they attained certain interesting though unexpected results, namely, the nucleo-histones of the thymus and the kidneys have no glycolytic power; the latter is very slight in the case of the nucleo-proteid of the liver, a little stronger in that of the thymus, stronger still in that of the kidney and maximum in the nucleo-histon of the liver. Bearing in mind the different distribution of these two bodies with regard to nucleus and cytoplasm, we may conclude that the nucleus of the hepatic cells is endowed with a strong glycolytic power, while their cytoplasm has this only to a slight degree or none at all. The reverse is the case with the thymus and kidneys. In this connection is pointed out the difference between what the authors denominate extrinsic and intrinsic metabolism. The latter has to do with those anabolic and catabolic processes in which there is the construction and destruction of the living proteid substance. On the other hand, extrinsic metabolism comes into play when the cells exert a chemical action on the substances that come into contact with them, but which do not form part of the living protoplasm. This is the form of metabolism which the authors are investigating. For example, the action of the liver on glycogen and on glucose. With regard to this organ it thus appears that the nucleus as well as the cytoplasm can share not only in the intrinsic metabolism of the cell, which has been known for a long time, but also in the extrinsic metabolism; at any rate, they share in these different processes to a different degree. While the nucleus as well as the cytoplasm of the liver cell destroy glycogen, only the nucleus destroys glucose and only the cytoplasm destroys hemoglobin. This destructive action in hemoglobin is, however, exercised also, although to a slighter degree, by the cytoplasm of the cells of the kidneys and thymus, while the nucleus never participates in this action. One may conclude that all the cells of the organism share more or less in the destruction of hemoglobin. It thus appears that the catalytic phenomena of the body are not always to be attributed to enzymes produced by the living cell, but that they are also peculiar to certain chemical substances produced by the living cell, and forming part of the protoplasm. The catalytic action of the nucleo-proteids is exercised not only when they are in solution but also when they are in suspension. Neither alcohol, corrosive sublimate nor chloroform inhibits the destructive effect of the nucleo-proteids of the liver on hemoglobin. This whole series of experiments suggests lines of inquiry of extreme interest to physiology and practical medicine.

**Influence of Speed, Temperature and Practice on Metabolism.**—Every research that throws light on the mysterious metabolic processes of the body is welcomed by physiologist and clinician alike. To the large number of painstaking investigations of all the factors that in any way influence the exchange of material in the body are now added those of N. Zuntz (Pflüger's Arch., Vol. 95, Nos. 3-4). He finds that contrary to the case in man and the horse, speed in dogs has no perceptible effect on metabolism for a unit of distance. With increased body-temperature, the metabolism for the resting body, and in the case of the respiratory work is increased. The muscles, however, perform a certain amount of work with the same expenditure of material as in the case of normal temperature. The amount of expenditure of tissue for single acts of the musculature is considerably reduced by practice. But in the case of any definite piece of work, practice does not cause any saving of metabolism in the case of any other, not specially practiced, operation. The greater the exercise of the muscles, the greater is the metabolism of rest, just as in the case of forced proteid feeding.

**Size of Body and Metabolism.**—As the result of a series of experiments on dogs, B. Slowtzoff (Pflüger's Arch., Vol. 95, Nos. 3-4) found that during horizontal movement of an animal, the smaller the animal the greater the amount of work for the same mass moved a given distance. During rest, metabolism is dependent on the extent of surface of the animal, although this is not the only factor that determines the degree of metabolism. The expenditure of work during horizontal motion is only approximately proportional to the extent of bodily surface; there are others, as yet unknown, factors that cause individual deviations from this rule. The expenditure of work during climbing is markedly different for different animals, no regular relationship between these differences and size of body having yet been discovered.

**Anatomy of Portal Anastamosis.**—Since the surgical treatment for cirrhosis of the liver has resulted so favorably in many instances, the normal anastomotic channels between the portal and systemic circulations have become the subject of considerable investigation, in order to understand more fully nature's methods of relieving the distressing symptoms of this disease. R. Floyd (Med. Rec., July 4, 1903) has found by dissections that these are from normal sites of anastomosis between the portal and systemic veins in the adult: (1) Anastomoses at the lower end of the esophagus which lie chiefly between the mucous and muscular layers of its walls; (2) rectal anastomoses between the inferior hemorrhoidal veins flowing into the internal pudic, the middle hemorrhoidal flowing into the internal iliac and the superior hemorrhoidal branches of the inferior mesenteric; (3) the accessory portal veins of Sappey. These are veins in the suspensory ligament of the liver which establish anastomoses between the liver and the veins of the diaphragm and anterior abdominal wall; (4) the retroperitoneal veins, which join the veins of

the posterior abdominal wall to the duodenum, pancreas and part of the colon where these lie in direct contact with posterior wall of the abdomen.

**Effect of Suprarenal Capsule on Blood Vessels.**—An investigation of the precise action of adrenalin on the blood vessels of a rabbit's ear under varying circumstances was made by S. J. Meltzer and C. Meltzer (Am. Jour of Physiol., July 1, 1903) with the following results: The subcutaneous injection of suprarenal capsule exerts a distinct effect on the blood-vessels of the ear. In normal animals a large, distinctly poisonous dose causes blanching of the ear. On the other hand, a medium dose causes a moderate but distinct dilatation of the blood-vessels. In rabbits in which the vasomotor nerves were cut on one side, a subcutaneous injection of a medium dose of adrenalin induced a distinct contraction of the vessels on the operated side and a dilatation on the unoperated side. Apparently adrenalin is but very little oxidized in the subcutaneous tissues.

**The Significance of Diabetes.**—It would be interesting, if space permitted, to review the entire subject of the physiology of glycogen in all its relations, as presented in a treatise of 398 pages by E. F. W. Pflüger (Pflüger's Archiv, Vol. 96, Nos. 1 to 8). It will suffice to review his conclusions as to the real nature of the physiological changes that lie at the basis of diabetes mellitus, which conclusions are of extreme practical interest. To Claude Bernard must be given the credit for the discovery not only of glycogen, but also of the fact that the nervous system exercises a powerful influence in the conversion of glycogen into sugar. Furthermore, he located in the floor of the fourth ventricle the so-called "diabetes center," for the puncture of this region increased the amount of the sugar in the body to such an extent as to occasion its appearance in the urine. This increased saccharine output was attributed by Claude Bernard to nerve impulses transmitted along the vagus nerves to the liver, but the later researches of C. Eckhard have shown that these impulses pass along the splanchnics instead, so that sections of the latter prevents the increased output of sugar. A fact of great importance was pointed out by the famous French physiologist, namely, that artificial diabetes is the result of a stimulation and not of a paralysis of function. It had been shown that certain salts as well as other substances produce glycosuria by stimulation of the sugar center in the medulla oblongata. Bernard thought that the influence of curare, morphine and puncture of the medulla, in producing diabetes, acted through the nervous system on the blood-vessels, leading to an increased circulation and therefore to an accelerated activity of the glycolytic ferment of the liver. The late experiments of Heidenhain have shown that after poisoning with atropine stimulation of the cervical sympathetic produces a secretion from the submaxillary gland, although the circulation in the latter is markedly reduced. This made it clearer that specific secretory nerves control the activity of the various glands. Analogy would indicate that in the splanchnic nerves there are not only fibers innervating the hepatic blood-vessels, but also fibers whose specific energy consists in exciting the sugar formation of the liver. This last is brought about immediately by means of a diastatic ferment. It would appear that the nerves, acting upon the cellular substance cause a splitting off of this ferment, which is a decomposition product of the protoplasm. According to Pflüger, this fact explains the phenomenon that in the course of a series of convulsions preceding the death of an animal, there is an associated innervation of the liver, expressing itself in the formation of a large quantity of ferment and the consequent rapid accumulation of sugar. From this explanation it can be rapidly understood how other provinces of the nervous system than those already mentioned can come into relation with the formation of sugar. Stimulation of the central stump of the depressor nerve, or of the cervical sympathetic, section of the right or left sciatic nerves and certain diseases of nerve-trunks, such as neuralgia of the trigeminal nerve, paralysis of the facial nerve and apoplexy, have all produced glycosuria. Knowing the ease with which stimulation of many different nerves produces glycosuria, one is tempted, from the standpoint of the diabetic, to deprecate this mechanism. The physiologist, however, inquires after the possible purpose of such an arrangement in the body. The author finds this purpose in the fact that as the muscles and other tissues use up by active work their supply of reserve food, some provision must be had for notifying the liver that more nutritive material is required. In this is found the significance of the reflex nervous stimulation of the liver. In this wonderfully efficient mechanism one sees an expression of the law formulated by Pflüger, namely, the law of self-regulation. The muscular contraction that creates the need, at the same time occasions its satisfaction. As in the case of the regulation of the heart-beat there are two antagonistic systems of nerves, one increasing and the other diminishing its work, so it appears that for the regulation of the content of sugar in the blood there are provided two antagonistic mechanisms. In this way pancreas-diabetes is most naturally explained by the supposition that the rising sugar-content of the blood occasions the separation from the pancreas of a substance which, passing into the blood, diminishes the sugar-forming activity of the liver—either by acting upon the sugar center of the medulla or upon the substance of the liver cells directly. The acceptance of the hypothesis of these two antagonistic mechanisms would remove all difficulties in the way of a clear explanation of the significance of diabetes. These difficulties centered in the fact that frequently in cases of severe diabetes the pancreas is not only apparently, but also actually, entirely healthy. If, as the result of certain conditions in the sensory nerves or of the brain or spinal cord, or as the result of direct stimuli of the liver cells, the production of sugar is extraordinary, then the inhibitory activity of the anti-diastase of the pancreas is no longer sufficient to bring about the normal equilibrium. Here is to be seen diabetes in spite of a healthy pancreas. If this organ is diseased no anti-diastase is produced, and the normal reflexly aroused formation of sugar continues in the liver, with the accumulation of this substance in the blood, for the normal inhibition of the sugar-output is absent. Another difficulty was found in the fact that certain cases occur in which the entire pancreas seems to be degenerated, without the presence of diabetes. It is impossible, however, to state that there are not a few cells which, although diseased, are capable of exercising their function. It is furthermore possible that in cases of carcinoma the weakening of the vital forces causes such a marked diminution of the sugar forming capacity of the liver that even without the need of inhibition no diabetes results. All the organs of the body stand in reciprocal relationship with the liver, in order to regulate the needs of nutrition. This relationship is rendered possible above all by the nervous system, but also by means of certain substances that are produced by the various organs. A continuous play of forces and counterforces determines the dynamic equilibrium that corresponds to health. It is therefore easy to comprehend how it is possible for apparently innumerable substances to bring about glycosuria. It appears nevertheless open to consideration that an error of metabolism may give rise to a substance that produces glycosuria,

and Hans Leo seeks in such a substance the origin of diabetes. But this will not explain puncture diabetes nor pancreas diabetes. For the latter seems to be due not to the presence of any substance, but to the absence of some substance. In the blood of diabetics there is found acetone, which, according to Ruschhaupt, produces glycosuria, but which is rather the result of this disease. There is again to be taken into consideration the fact that a substance which produces glycosuria in healthy individuals may perhaps have the opposite effect in diabetics. Such a substance is morphine, which causes glycosuria in sound individuals and lessens it in those suffering from diabetes. These, at first sight, puzzling facts are easily explained, if one takes into consideration the circumstances that the regulation of the sugar-formation of the liver, like that of the heart-beat, is brought about by accelerating and inhibitory processes. In the healthy morphine stimulates both sets of processes, but those that accelerate the production of sugar are the stronger. In diabetics the accelerating processes, being continually at work, are thereby weakened, hence the morphine administered, while still arousing both sets of processes, gives to the inhibitory ones the upper hand. This is similar to the phenomenon in which, after section of the freshly exposed sciatic nerve and stimulation of the peripheral stump, the vasoconstrictor prevail over the vasodilator nerves. If stimulation be deferred until a day after section of the nerve, the vasoconstrictors losing their irritability more rapidly than the vasodilators, stimulation of the peripheral stump causes expansion of the arteries. Starting out with the supposition that the formation of sugar in the organism under normal conditions, depends upon a dynamic equilibrium of the various functions, it is easily understood how a great many substances can produce glycosuria. Every foreign substance has some untoward action in our body. However this substance act, one cannot expect that it will effect force or counterforce in an equal degree. It will disturb the equilibrium. Many clinicians oppose the doctrine that diabetes is a neurosis, inasmuch as autopsy frequently discloses no disease of the brain, spinal cord, liver or pancreas. But the crudest logic alone asserts that there can be no disease without a diseased organ. Moreover, those very diseases in which pathological anatomy frequently finds nothing, are diseases of the brain. Those clinicians who will not recognize in diabetes a neurosis report that frequently purely psychical causes lie at its base. Unanimous are all authorities in this domain, that there is but one reliable remedy for this disease, namely, opium. According to a well-known clinician, opium is valuable even though the case of diabetes is not one of nervous origin. According to Pflüger, opium is always efficient merely because every case of diabetes is founded on a nervous basis. The latter is often the necessary result of another disease, which is no neurosis, so that the diabetes is merely a symptom.

**The Effect of Laked Blood upon the Heart.**—The result of a series of experiments performed by E. Pratzenburg (Pflüger's Archiv, Vol. 95, Nos. 11 to 12) showed that the blood of the ruminants and particularly that of the rabbit, guinea-pig, horse, pig and man, after dissolution of the red blood-corpuscles, is not in a condition to nourish the isolated heart of the frog, while the same varieties of blood, in the same concentration, but with the red corpuscles intact, afford a necessary food for the heart. In complete contradiction to these results are those in which the cystolic blood of cats and dogs has kept up the activity of the heart for hours at a time. These results agree with those obtained by Langendorff, who found that the isolated heart of the cat and dog can be nourished by the laked blood of the same animal, which is not the case, however, with the rabbit. If the various forms of blood used in the above experiments be compared, there will be found marked differences in the content of a certain substance, which, provided largely in the red corpuscles, is by their dissolution set free and thereby acquires the opportunity of exerting upon the heart an influence which, in the intact condition of the corpuscles, it is not able to manifest. This substance is potassium. The forms of laked blood that showed an abundance of $K_2O$ were those which had a particularly deleterious influence upon the frog's heart. On the other hand, those forms of blood poor in $C_2O$, even in the cytolytic condition, were excellent cardiac nutrients.

**The Absorption and Fermentative Splitting of the Disaccharides in the Intestine.**—The results of a series of experiments performed on dogs by F. Rohmann and J. Nagano (Pflüger's Archiv, Vol. 95, Nos. 11 to 12) showed that of the three disaccharides, cane-sugar is absorbed the quickest, next comes maltose, and last of all milk-sugar, which is absorbed much more slowly than either of the others. The absorption of the disaccharides is better in the upper than in the lower part of the small intestine, and is slower than that of the simple sugars that are formed from them by splitting. The amount of sugar absorbed is also dependent upon the concentration of the solution of sugar present in the intestine. Moreover, the absorption of water is dependent upon the kind of sugar present in the intestine, and, in the case of any one form of sugar, upon its concentration. In seeking to bring the greater absorptive capacity of the jejunum into some numerical relationship with the latter, the authors find that the weight of the mucous membrane relatively to its length is without exception far greater in the jeunum than in the ileum. Moreover, one gram of jejunal mucous membrane takes up more sugar than one gram of mucous membrane in the ileum. The concentration of the solutions of sugar in the intestine need not be higher than 5 per cent. in order that all the sugar eaten should be absorbed. The water of cane-sugar solutions is more quickly taken up than that from solutions of maltose or milk-sugar. On the other hand, water is more readily absorbed in the ileum. The spontaneously secreted juice of the jejunum contains very little invertin, which is able to split up only a small portion of the sugar absorbed. While cane-sugar and maltose are split up to a certain degree before they are absorbed, milk-sugar is not split up. Although in the absorption of a two-per-cent. solution of cane-sugar in the ileum no invertin is secreted by the mucous membrane, yet the latter has the power of splitting up the sugar, if not completely, at least to a great degree. This power of the mucous membrane is greater in the case of the jejunum. Five per cent. is approximately the concentration of sugar, in the presence of which the inverting capacity of the jejunum as well as the ileum is capable of splitting the absorbed sugar into dextrose and levulose. If there enter the intestine solutions of sugar of a greater concentration, it is possible that cane-sugar enters the circulation unsplit. It is then cast off by the kidneys as a foreign body. The inversion that is caused by an enzyme present in the mucous membrane exceeds that which results from the action of an enzyme liberated from the mucous membrane. Moreover, the inversion of cane sugar occurs as soon as it come in contact with the intestinal mucous membrane. These results do not agree with the earlier experiences of physiologists. Enzymatic activity has been hitherto considered as possible only in solutions, in the secretions, or in the extracts of organs. According to Hoppe-Seyler, in such solutions the ferments act like dissolved electrolytes.

*e.g.*, invertin like hydrochloric acid. According to the author, this analogy would not hold at the present day, for the solutions of enzymes are not true solutions but colloidal solutions. It is possible that invertion exists in a colloidal form in the cells of the intestinal mucosa. It decomposes the cane-sugar when the solution of the latter merely comes in contact with the cells. What has been found true with regard to the inversion of cane-sugar is also true of maltose, with the exception that dextrose only is formed from maltose, and the maltose secreted by the ileum is relatively more abundant than the invertin. As regards milk sugar it was found that the mucosa in the upper part of the small intestine splits this sugar only at times and then in very small amounts, while the membrane of the lower parts of the intestine act upon it very slightly or not at all. This failure of enzymostic splitting explains the slow absorption of milk-sugar.

## OBSTETRICS AND GYNECOLOGY.

**Morphine-Scopolamin Narcosis in Gynecology.**—It is rather disappointing to perform larger gynecological operations with morphine and scopolamin injections, according to S. Flatau (Müuch. med. Woch., July 14, 1903), for the amount of ether or chloroform necessary to produce complete relaxation was almost as large as under ordinary conditions and retching and vomiting were prominent after-effects. By increasing the doses of the two drugs, however, smaller operations, such as vaginal plastics, could be done successfully even without ether or chloroform. With three doses of ⅙ grains (1.01) morphine at intervals of one to two hours and $^1/_{60}$ grains (0.0012) scopolamin, it is, however, necessary to examine the heart, lungs and urine of the patient most carefully. In 22 out of 30 cases the narcosis was perfect; the respirations were deep and regular, the face somewhat flushed and the pupil dilated. In the other, the excitation was so marked that small amounts of chloroform were necessary. Vomiting or other after-effects did not occur, in fact the patient awoke in excellent condition 4 to 8 hours after the operation. It is well to give a trial injection the night before, to be assured that no idiosyncrasy toward the drugs exists. With all care the author was so unfortunate as to lose one case, but here probably a degeneration of the heart subsequent to hemorrhage was present. For general use in surgery and in obstetrics this method of narcosis must still be regarded as too dangerous.

**Abdominal Hysterectomy by "Décollation."**—This operation, the essential feature of which lies in amputation of the neck of the uterus (décollation) prior to removal of the body, was originated by J. L. Faure (Trib. Méd., July 4, 1903) some three years ago, and has been practised by him since that time in the majority of cases requiring abdominal hysterectomy. The author makes the section at a point corresponding to the uterine isthmus; after which, the body being no longer held down by the vaginal attachment of the cervix, it is a comparatively easy matter to sever the sole remaining attachments to the pelvis, that is, the broad ligaments. In the absence of too extensive adhesions between the uterus and rectum or adnexa, the isthmus is most readily reached from the cul-de-sac of Douglas. The section is made from this point with a pair of curved blunt scissors, and the body left freely movable and easily subjected to its further detachment from the pelvis. In the presence of extensive adhesions in Douglas' cul-de-sac or of a retroflexed uterus, the isthmus should be attacked from the front; that is, within the vesico-uterine cul-de-sac, where it may be reached and resected from before backward with the curved blunt scissors. In the author's opinion, preliminary section of the neck of the uterus gives to abdominal hysterectomy a facility and simplicity which should lead to the general adoption of this method.

**Pregnancy Complicated by Fibroids.**—When one has seen patients with multiple fibroids pass through the course of pregnancy, labor and puerperium in an entirely normal way, or has discovered such growths for the first time after the uterus is emptied, Henry C. Coe (Am. Jour. of Obstet., June, 1903) thinks that one is apt to regard with disapproval the sweeping statements of those alarmists who see danger and death in every case of pregnancy complicated by fibroids. Fortunately the chances of conception, especially in the case of large tumors, are comparatively slight. Olshausen (Veit's Handbuch der Gyn., 1897, Vol. II, p. 7,651), by combining series of observations, estimates that 30 per cent. of all women with fibroids are sterile, while Winckel states that 41.6 per cent. of women with fibroid uteri who have borne children are uniparæ. No statistics have been given showing what proportion abort in the early months. Cases of pregnancy complicated by fibroids may be included under four headings, viz.: (1) Those in which pregnancy will doubtless go on to full term with prospect of a normal delivery; (2) those in which the patient must be kept under constant observation in view of the necessity of possible interference; (3) those in which there is considerable risk to the mother or child, or both, before and during labor; (4) cases in which surgical interference is absolutely indicated. Hence the treatment may be: (1) Entirely expectant; (2) non-surgical, with the possible anticipation of the date of normal labor; (3) surgical, either (a) conservative, or (b) radical. Where the pregnancy had not advanced beyond the third month one would be influenced by the previous history. The writer feels that it is the obstetrician's duty to warn a young woman against pregnancy where she has a fibroid tumor which may give rise to serious trouble, even though it has never caused any marked symptoms. If she is determined to marry, nevertheless, the propriety of performing a conservative operation (myomectomy) for the removal of the tumor, may be considered. Under proper limitations this would be quite justifiable, and numerous successful cases have been reported in which normal pregnancy and labor have followed. How far it is possible to go in advising married women with fibroids to avoid conception is a question which each one must answer to his own conscience. In the presence of a neoplasm which has already acquired surgical importance, it is certainly unwise to allow the patient to incur the additional risk of a pregnancy which can only terminate unfortunately.

**Therapeutic Feticide: it's Medicolegal Aspect.**—Of late there has been a great deal of discussion upon this subject by the various French Societies, and in an able paper Ch. Maygier (Obstetrique, May, 1903) sets forth the following conclusions on the subject: (1) The physician should incur only the responsibility in the terms of a common duty; that is to say, if it is possible to be relieved of all charge of mistake, imprudence or of negligence, by putting aside the scientific aspect of the question of advisability of such procedure; (2) the surgeon should not perform feticide without the formal desire of the patient, who should be possessed of all her mental faculties and in full realization of what is being done; (3) the operation should only be done in cases of exceptional urgence or in other conditions which cannot be prevented, under which circumstances the physician may intervene without the knowledge of the patient. (4) In no case should the physican permit himself to substitute an operation for the one proposed by him. Should it be urged by the patient or those having

legal authority to act for her, provided the doctor considers such an operation dangerous or inopportune? The refusal to accept his intervention under the conditions proposed by him, relieves him of all obligation and of all responsibility as to the consequences of his refusal to act. Humanity alone should make it a duty for him to intervene.

**Conservative Surgery on the Adnexa.**—In discussing the relative value of this method of dealing with lesions of the adnexa, Hector Treub (Annals of Gyn., May, 1903) remarks that the danger of death from operation should not be more than two per cent. One cannot always be sure of affording the patient a complete cure of the trouble for which the operation was performed, so that there is a good possibility that a secondary operation, radical in character, may have to be performed some later period. Moreover, there is no way to foretell that the operation may not produce a new malady in the shape of a precocious menopause. In salpingo-oophoritis the so-called medical treatment is all that is necessary in a goodly proportion of the cases. If the medical treatment has been insufficient or contra-indicated, a radical operation should never be done at the outset, no matter what the conditions may be. Posterior colpotomy should always be the first step in the operative procedures. When by this means one has found that there is a tuberculous condition to deal with a hysterectomy may be readily performed. Where there is a stubborn hydrosalpinx after repeated colpotomy, and which necessitates other intervention, and in the case where one is going to try to remedy sterility in women, conservative abdominal operations (resection, salpingotomy, salpingo-oophorosydesis) are indicated. Salpingorraphy should be reserved as an accessory operation during the performance of a laparotomy performed for no matter what other indication.

**The Treatment of Retroversio Uteri.**—The most excellent treatment of this subject in a paper by Dr. Figuiera, of Nice, is analyzed by M. Morisette (La Gynécologie, June, 1903). Taking up the condition in pregnant and non-pregnant, the following are the conclusions of the author as to the proper method of treatment: (1) Curative treatment of retrodeviation of the uterus favors fecundation with women who have been sterile; (2) in recent retrodeviations, where the uterus is freely movable, the employment of pessaries may be most successful in the production of a cure of the trouble. The period of genital involution is truly the psychological period of the pessary. (3) In women with intact peronea in the absence of lesions of the adnexa, the Alexander operation is the one of choice. Where there are adhesions of the adnexa, laparotomy is indicated, followed by abdominal fixation and transfixion of the round ligaments. (4) In multiparæ who have torn perineums the abdominal fixation should be supplemented by plastic operations upon the cervix, vagina and perineum. This is the combined treatment of M. Doleris (1887-88.) In retrodisplacements of the gravid uterus manual replacement should be performed as soon as the condition is recognized. If this is not permissible, one should do celiotomy and shorten the round ligaments intra-abdominally, and there will result a direct and definite cure of the deformity.

## GENITO-URINARY AND SKIN DISEASES.

**New Methods in Treating Hydrocele.**—In an article dealing with the diagnosis and treatment of hydrocele, F. D. Roldán (Rev. de Med. y Cir. de la Habana, No. 10, 1903) describes an apparatus devised by him for the introduction of medicinal fluids into the sac after evacuation of the contents of a hydrocele. This apparatus is composed of three parts: A gutta percha canula which is adaptable to any trocar, a graduated glass vessel with a capacity of about 8 ounces and a vulcanized rubber tube 13 inches long connecting canula and vessel. With this apparatus a variety of maneuvers may be executed without removal of the canula from the tumor. Its advantatges may best be appreciated by a description of the author's method of procedure after evacuation of the tumor. The canula being inserted, from 1¼ to 2 ounces of a 1-in-100 solution of cocaine is poured into the glass graduate and by raising the latter, the fluid is made to flow into the sac. After two minutes, this is withdrawn by inverting and carrying the vessel below the level of the tumor. The vessel is next raised and into it is poured tincture of iodine, which is in turn allowed to flow into the sac by carrying the graduate above the tumor. This fluid is retained for three to four minutes, when it is syphoned out by inverting and lowering the vessel. The sac is then thoroughly washed out with sterilized water, which has been poured into the graduate, by alternately raising and lowering the vessel. A new method of closing the wound made in the radical treatment of hydrocele has also been devised by the author. The details of this procedure are seen at a glance in the illustrations accompanying the article, and to this the reader is referred. Suffice it to say that two rows of continuous sutures are used; one for the vaginal sheath, the other for the skin; and by an ingenious arrangement both may be removed simultaneously and without pain after healing has taken place.

**Epidural Injections in Genito-Urinary Diseases.**—Epidural injections, *i.e.*, injections between the periosteum of the vertebræ and the dura mater in the sacral region, constitute a new and apparently very successful method of treating functional diseases of the genito-urinary tract. A. Strauss (Münch. med. Woch., July 14, 1903) employs a solution consisting of cocaine muriate gr. $\frac{1}{6}$ (0.01), sodium chloride ʒiij (0.2), aq. destill ad. ʒiij (100.0), to which are added 2 drops of a 5-per-cent. solution of carbolic acid. In repeated doses of 1¼ to 7½ drams (5 to 30 cubic cures) much improvement was accomplished in enuresis nocturna, acquired incontinency, neuropathic polyuria, impotency and spermatorrhea and sexual neurasthenia. Untoward symptoms do not occur though sometimes the patients complain of a sensation of pressure in the lower spine which rapidly disappears with rest. For syphilis a 2-per-cent. solution of sublimate was used every second day or a 10-per-cent. solution of salicylate of mercury in liquid paraffin twice weekly; contrasted with the intramuscular method the reaction was, however, more severe, so that the latter is to be preferred for dispensary use. It is possible that in the cerebral and spinal manifestations of lues, this form of giving mercury has a great future provided salts that are better tolerated are employed.

## NEUROLOGY.

**Tabes and Marriage.**—A statistical article based upon a study of 240 tabetics and dealing with the influence of tabes upon fecundity and the health of the offspring in marriages in which one parent was afflicted with locomotor ataxia, is presented by A. Pitres (Jour. de Méd. de Bordeaux, July 12, 1903). The 31 celibates of this number are dismissed by the author without comment. The issue of the remaining 209 amounted to 483 children; of whom 197 were still-born or died in the early months and 286 survived; making an average of 2.31 births to each couple, with but 1.36 living children. Carrying the analysis further, the author states that of the 209 marriages, 42 or 20 per cent. were absolutely sterile, 32 or 15 per cent. resulted in still-births

or death shortly after birth; while in the remaining 135 or 60 per cent. there were living children in the relatively high proportion of 2.11 per family. The high mortality seen in the offspring of tabetics, the author believes, is attributable to the antecedent infection rather than indirectly to tabes; and this infection is, in the majority of cases, syphilitic. He cites figures which go to show that the mortality of children born before development of tabes in either parent was 44 per cent.; while those born after the appearance of tabes showed a mortality of but 28 per cent. This finding furnishes, in his opinion, additional proof of the statement made by Régis, to the effect that the offspring of tabetics have a better chance of life and health when born in the later stages of the parents' disease than at a period nearer to the antecedent infection. As to the outcome of his investigations looking to the determination of the influence of syphilis upon the mortality of tabetics' children, the following figures are quoted: Of 77 male subjects who had undoubtedly had syphilis, 187 children were born, of whom 33 per cent. were still-born or died in early infancy, and 67 per cent. survived. Of 34 who denied antecedent syphilis, 81 children were born, of whom 20 per cent. were still-born or died shortly after birth and 80 per cent. survived. With few exceptions, Pitres finds that the surviving children of tabetics are uninfluenced by the parents' disease; their physical and intellectual development proceeding normally as that of other children; and of the 286 children of tabetic parents, whom he kept under observation, many were alive at twenty years, and some had attained thirty and thirty-five years at the time of writing. In none did tabes or Friedreich's disease develop, neither was there evidence of any other nervous affection. None showed signs of physical or mental degeneracy, nor was the influence of syphilis apparent in any. On the other hand, some developed diseases independent of all hereditary influence; such as tuberculosis, rheumatic cardiopathies, etc. The great majority were, however, healthy in body and mind.

## EYE, EAR, NOSE AND THROAT.

**Erysipelas of the Larynx.**—Massei pointed out some time ago two varieties of erysipelas of the larynx: one where the general symptoms were prevalent, the other where the local symptoms were the most prominent. KONTCHERSKY (Prakt. Vratch., No. 25, 1903) presents an interesting case in which this subdivision is fully borne out by clinical experiences. The disease began in a woman, 49 years old, with pain in the throat, difficult deglutition, general malaise and headache. There was also considerable tenderness, congestion and swelling of the aryepiglottic ligaments. The condition did not yield to routine treatment and grew considerable worse. The patient became very hoarse, dyspneic, and suffered intense pains at every effort to swallow. Laryngoscopically the epiglottis was found so swollen as hardly to be recognized; it was impossible to make out the condition of the vocal cords. Under treatment with compresses, etc., some improvement was obtained and this continued for some time. However, with the local improvement there appeared gradually a condition that showed systemic infection—pain and feeling of heaviness in the head, tinnitus aurium, general weakness, inability to stand erect. The pulse, though normal in rate, was quite weak. From time to time attacks of fainting. In the course of a couple of weeks the condition grew still worse—the headache and noise in the ear became intolerable, and to these were also added hallucinations of sight and hearing of a very pronounced character. This continued for a week, and then disappeared without leaving a single trace. The author in discussing this case leans to the view that the affection was one of a general and not of a purely local nature; and it must have been of an erysipelatous character, because of the rapid and enormous swelling of the epiglottis, as well as the presence of a gray exudate, which disappeared, however, in the course of one day, leaving a marked erosion, which lasted for quite some time. The course of the disease after the disappearance of the local symptoms, mental dulness, hallucinations of sight and hearing, point to some systemic infection similar to that observed in typhoid, grippe and erysipelas. According to Massei primary erysipelas of the larynx is not to be diagnosed necessarily from the presence of cutaneous erysipelas anywhere else as it may appear without the latter. When Senator, in 1888, delivered an address on the so-called primary phlegmar of the pharynx Virchow pointed out that this was not an independent disease but a septic affection often in connection with puerperal sepsis, while Guttman has called attention to its similarity to an erysipelatous process. The author also mentions the general prevalence of erysipelas in the locality where the patient lived as well as the surrounding unhygienic condition that would still strongly substantiate his view as to the erysipelatous character of the case in question.

**Embolism of Central Artery of Retina Following Paraffin Injection Into Nose.**—A careful review of the literature reveals the fact that serious complications following the supposedly harmless injection of paraffin are not very infrequent. L. M. HURD and W. A. HOLDEN (Med. Rec., July 11, 1903) report an interesting case in which sudden blindness of one eye occurred a few minutes after such an injection for the improvement of the appearance of a nose after two previous successful injections had been made upon the same patient. A little ecchymosis appeared about the end of the nose indicating that a vein had been punctured. An immediate examination of the eye showed that the inferior branch of the arteria centralis was bloodless and the superior branch nearly so. An attempt was made to dislodge the embolus and force it forward into one of the branches. To accomplish this the heart was stimulated and the peripheral vessels dilated. The eyeball was pressed back into the orbit as far as possible to completely empty the ocular vessels and then by suddenly releasing it, it was hoped that the embolus might be drawn on by suction. This was unsuccessful and there was no subsequent improvement in the vision of that eye. It is, of course, difficult to explain how an embolus could get from a systemic vein into the central artery without being caught in the capillaries of the pulmonary circulation.

## THERAPEUTICS.

**Detection of Phosphorus in Oil.**—It is a well-known fact that oils containing small amounts of phosphorus, such as are used for internal administration, rapidly lose their efficacy when exposed to air and light, owing to oxidation. A simple method to estimate the amount of phosphorus, such as is given by W. STRAUB (Münch. med. Woch., July 7, 1903) is therefore welcome. Ten cubic centimeters of the oil are simply shaken with five cubic centimeters of a five-per-cent. solution of copper sulphate. A light brown to black discoloration, owing to formation of cuprous phosphate, will result. Somewhat later all the phosphorus will pass over into the aqueous part of the mixture as phosphoric acid, which can be determined voluntarily in the usual way, if the estimation by means of the depth of color is considered too inaccurate. A solution with only 0.0025 per cent. still gives an appreciable reaction, while the officinal oil of phosphorus gives a distinct brown discoloration after three to five minutes.

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## THE MEDICAL STUDENT IN THE UNITED STATES.

The *Journal of the American Medical Association* has just published (Aug. 15, 1903) its third annual Educational Number and it is a noteworthy and commendable undertaking.

Among other features discussed, that on the opportunities for medical education is naturally one of the most interesting and the figures given are well worthy of presenting. They say that the number of medical students in the United States for the year ending June 30, 1903, was 27,615. Of this number 24,930 were at the regular schools, 1,498 at the homeopathic, 848 at the eclectic and 339 at the physio-medical and nondescript schools. There was an increase in the attendance at the regular schools of 52 over last year, and an increase of 1,094 over the year previous—1901. In the homeopathic schools there was a decrease of 119 below that of 1902, and a decrease of 185 since 1901. The eclectics have increased in the number registered. This past year there were 848 registered, against 765 of the preceding year, and 664 in 1901, showing an increase of 83 over 1902, and 184 over 1901. Those in attendance at the physio-medical and nondescript schools numbered 339, an increase of 98 over last year, and 115 over 1901. The comparative table that they present is as follows:

TABLE OF MEDICAL COLLEGE ATTENDANCE.

| Year. | Regular. | Homeopathic. | Eclectic. | Physio-Med. and Nondescript. | Total. |
|---|---|---|---|---|---|
| 1880 . . . | 9,776 | 1,220 | 830 | . . . | 11,826 |
| 1890 . . . | 13,521 | 1,164 | 719 | . . . | 15,404 |
| 1900 . . . | 22,710 | 1,909 | 552 | . . . | 25,171 |
| 1901 . . . | 23,840 | 1,683 | 664 | 224 | 26,417 |
| 1902 . . . | 24,878 | 1,617 | 765 | 241 | 27,501 |
| 1903 . . . | 24,930 | 1,498 | 848 | 339 | 27,615 |

Speaking of graduates, they show that the total number of graduates in medicine for the year ending June 30, 1903, was 5,698, an increase of 669 over the preceding year. This is an increase of only 254 over the number of graduates for the year ending June 30, 1901. The decrease in the number of graduates in 1902 is assigned by the editor to the increased length of course of study and increased requirements by State boards. This decrease was considered by Dr. Simmons, in 1902, as only temporary, which is proving to be true. However, the normal condition as regards the number of graduates to the number of students registered has probably not yet been reached, for a very large number of the medical schools adopted the four years' course during the last three years. The statistics on this point are as follows:

TABLE OF MEDICAL COLLEGE GRADUATES.

| Year. | Regular. | Homeopathic. | Eclectic. | Physio-Med. and Nondescript. | Total. |
|---|---|---|---|---|---|
| 1880 . . . | 2,673 | 380 | 188 | . . | 3,241 |
| 1890 . . . | 3,853 | 380 | 221 | . . | 4,454 |
| 1900 . . . | 4,715 | 413 | 86 | . . | 5,214 |
| 1901 . . . | 4,879 | 387 | 148 | 30 | 5,444 |
| 1902 . . . | 4,498 | 336 | 138 | 27 | 4,999 |
| 1903 . . . | 5,088 | 420 | 149 | 41 | 5,698 |

It is a pleasure to note that the number of medical colleges has decreased. The total number of medical colleges in the United States which grant the degree of M.D. is 154. Of these 121 are regular, 19 homeopathic, 10 eclectic, 3 physio-medical, and 1, the National Medical College of Chicago, nondescript, this institution advertising to teach not only according to the tenets of the four "schools" mentioned, but also osteopathy. In addition to the above, there are three schools which give instruction in the first two years' work. In other words, there are 157 institutions devoted to teaching medicine in the United States.

The number of medical schools, including for comparison the same statistics for the years 1880, 1890 and 1900, is given as follows:

COMPARATIVE TABLE OF MEDICAL COLLEGES.

| Year. | Regular. | Homeopathic. | Eclectic. | Physio-Med. and Nondescript. | Total. |
|---|---|---|---|---|---|
| 1880 . . . | 72 | 12 | 6 | . . | 90 |
| 1890 . . . | 93 | 14 | 9 | . . | 116 |
| 1900 . . . | 121 | 22 | 8 | . . | 151 |
| 1901 . . . | 124 | 21 | 10 | 4 | 159 |
| 1902 . . . | 121 | 20 | 10 | 4 | 155 |
| 1903 . . . | 121 | 19 | 10 | 4 | 154 |

An important and far-reaching feature of this statistical study concerns the location of colleges and their clinical advantages, and the ratio of schools to the population. The figures gathered by Dr. Simmons are worthy of the most careful consideration. He says that it is acknowledged by all who have given thought to the subject that a town of less than 50,000 inhabitants cannot except under unusual circumstances, supply the clinical advantages that third and fourth-year students require. Yet the fact is there are thirty medical colleges located in towns of less than 50,000 that confer the degree of M.D. Ten of these schools are in towns of between 30,000 and 40,000, two in towns of between 20,000 and 30,000, six in towns of between 10,000 and 20,000, and nine in towns of less than 10,000.

Concerning the ratio of schools to population he shows that there are 14 cities containing 4 or more schools each, and these cities contain 84 of the 154 schools. Below is a table of these cities, with population, number of schools and ratio of population to each school. The population in each instance is based on the census report for 1900. It is quite probable that the population of all of these cities has increased, but, if so, the relative increase is possibly about the same. It will be noticed that New York has the fewest medical schools in proportion to its population, and that Chicago has the distinction of having the largest number of medical schools of any city in the United States.

TABLE OF RATIO OF COLLEGES TO SIZE OF CITIES.

| City. | Population. | Number of Schools. | Ratio of Pop. To Each School. |
|---|---|---|---|
| Dallas | 42,638 | 4 | 10,659 |
| Nashville | 80,805 | 5 | 16,173 |
| Kansas City | 163,752 | 6 | 27,292 |
| Louisville | 204,731 | 7 | 29,247 |
| Indianapolis | 169,164 | 4 | 42,291 |
| Baltimore | 508,957 | 8 | 63,619 |
| San Francisco | 342,782 | 5 | 68,556 |
| Washington | 278,718 | 4 | 69,679 |
| Cincinnati | 325,902 | 4 | 81,475 |
| St. Louis | 575,238 | 6 | 95,873 |
| Chicago | 1,698,575 | 14 | 121,326 |
| Boston | 560,892 | 4 | 140,223 |
| Philadelphia | 1,293,697 | 6 | 215,616 |
| New York | 3,437,202 | 7 | 491,029 |

A complete discussion of this most elaborate study would lead to many interesting conclusions. One that strikes the practitioner concerned in the higher education of the young medical student is that the element of ignorance of his opportunities is no longer a bar to the best. The medical student of the future chooses his place of study with his eyes wide open to what there is to be found in the country. May this be the means of elevating the entire mass of institutions in their laudable competition to give the best.

## A NEW ERA IN CHLOROFORM ADMINISTRATION.

The stubble of a luxuriant corn-field is troublesome to uproot. It taxes the farmer's efforts in direct proportion to the strength and length of the stalk. It may or may not have borne good fruit. So, precisely, it is with the field of anesthetics.

Therefore, all laudable commendation upon the efforts of the chloroform committee of the British Medical Association! Its second report—1902-1903—brings the cheering news that definite progress is being made.

It cannot be amiss to glance at some of the stubble which this worthy body has encountered and which is pointed out not in any spirit of criticism, but simply to show how much chaff and how little grain constitutes the crop of our knowledge, even up to the present moment. Of diverse, divergent and dissenting opinions we have indeed a full crop.

The latest and undoubtedly one of the very highest American authorities is Brewer's Text-book of Surgery. It is crisp from the press and pregnant with the new and vigorous thought of its maker. In speaking of the administration of chloroform it says that the drug may be given upon a folded handkerchief held "two or three inches above the mouth to allow *a generous admixture of air*. . . . An effort should be made to give *ten per cent. of the vapor of chloroform* and ninety per cent. of air." Very distinct recognition is given the fact that danger arises from a too high concentration of the vapor, suddenly administered.

In Park's Surgery it is stated in italics that chloroform should always be given with ninety-five per cent. of air.

In the American Text-book of Surgery the administration of chloroform is described as follows: "A towel may be placed over the patient's mouth and be kept moistened by chloroform, drop by drop, or about a half teaspoonful should be poured upon a napkin and held about an inch from the face. . . . Experiment has shown that the vapor is inhaled under the condition just stated in the strength of five-per-cent. admixture with air, which is a proper proportion."

The eminent English authors, Rose and Carless, state that, "Much controversy has arisen as to whether the heart is ever directly affected by the drug or whether the symptoms are not due to

primary failure of the respiration. The experimental evidence on the subject is of a very conflicting nature and it is impossible as yet to consider the question solved. The Scotch school, headed by Syme and Lister, maintains that the breathing alone need be watched. Many surgeons and anesthetists oppose this view. . . . The chief points to be attended to are regularity of dose and full admixture with air so that not more than *four per cent.* of the vapor is inhaled."

Among these standard authors there is to be noted a variation from about ten to about two per cent. All recognize the importance of free dilution with air. None are prepared to instruct in any method which shall determine the percentage in more than a haphazard fashion.

We have passed the transitional stage, thanks to the efforts of the members of the committee of the British Medical Association, and should soon be in possession of all practical data to utilize the new methods and the apparatus desired, and methods endorsed by Sir Victor Horsley are not to be passed over lightly.

From a practical standpoint *the* conclusion in this report is that chloroform should be administered in quantities varying between 0.5 per cent. and two per cent. "An average of one per cent. is sufficient for the induction and maintenance of narcosis." The chloroform should be given through an inhaler so constructed that the delivery shall be continuous and shall be indicated on a percentage scale.

Although in this country the giving of ether has received a tremendous impetus since the multiplication and general adoption of the nitrous-oxide-ether inhaler, because this instrument has almost entirely done away with the disagreeable elements in ether taking, the field is not yet closed to chloroform.

Those who read the report will find a long list of operations which were successfully carried on with the aid of Mr. Vernon Harcourt's apparatus, in which the air to be inspired derives its chloroform vapor from being drawn over the surface of the drug. This differs from Dr. Junker's apparatus, in that his method consists in blowing air *through* the chloroform. The heat rendered latent by this procedure introduces a variation in the quantity of gas taken by the air. By instruments of exact measurements the modes of administration of anesthetics have been brought out of chaos to the precision required of a precise age. We congratulate the chloroform commission and its report.

## ECHOES AND NEWS.

### NEW YORK.

**The Eye and Ear Infirmary.**—Dr. Richard A. Derby, of the Board of Directors of the New York Eye and Ear Infirmary, announces that the gift of the late William C. Schermerhorn to the infirmary of a building to be devoted solely to the treatment of diseases of the eye has been supplemented by a gift from the daughters of Mr. Schermerhorn of money for the equipment of the building with all the necessary surgical appliances and furnishings.

**Barber Regulations.**—Copies of Section 179 of the revised Sanitary Code, which includes the new regulations for barbers, were sent out last week. There are eleven of these rules. Here they are: Barbers must wash hands thoroughly with soap and hot water before attending any person.

No alum or other astringent shall be used in stick form. If used at all, to stop flow of blood, it must be applied in powdered form.

The use of powder puffs is prohibited.

No towel shall be used for more than one person without being washed.

The use of sponges is prohibited.

Mugs and shaving brushes shall be thoroughly washed after use on each person.

Combs, razors, clippers and scissors shall be thoroughly cleansed by dipping in boiling water or other germicide after every separate use thereof.

No barber, unless he is a licensed physician, shall prescribe for any skin disease.

Floors must be swept or mopped every day and all furniture and woodwork kept free from dust.

Hot and cold water must be provided.

There is no rule to prevent a barber from sticking his thumb in a man's jaw to pull the surface smooth for shaving, but President Lederle, of the Health Board, says that it is understood that this practice must be discontinued. The regulations also advise customers to have their own brushes, combs, razors and shaving cup. The rules are to be hung in a conspicuous place in every barber shop, and violators are threatened with severe punishment.

**Obituary.**—Dr. John Gleises, of New York, who was spending the summer at Brookside, died August 14. He was fifty years old and leaves two sons.

### PHILADELPHIA.

**Chickenpox a Notifiable Disease.**—Chickenpox has been placed on the list of diseases that physicians must report to the Board of Health. On numerous occasions during the present prevalence of smallpox, physicians summoned before the Board for failure to report the names of patients suffering from that disease, have excused themselves with the plea that their diagnosis was chickenpox. In order to prevent this shielding of smallpox patients, the Board has decided that chickenpox, as well as smallpox, must be reported.

**Results of the Ball Park Accident.**—A general inspection of all places of amusement, including theaters and outdoor resorts, has been begun by the building inspectors. The larger part of the outdoor stand at the Philadelphia Ball Park will have to be rebuilt before games are allowed. As result of the recent accident twelve people have died. Donations are being made to the Samaritan and St. Luke's hospitals to aid in replenishing supplies which were all used in caring for those wounded at the accident.

**Woman's Hospital.**—Plans for the new Woman's Hospital have been filed. It is to be a six-story building of granite, limestone, and terra cotta.

## CHICAGO.

**Chicago's Milk Supply Improving.**—Out of 760 samples of milk and cream analyzed in the Laboratory during the week 60 were found below grade. Among these 760 samples from all sources there were 112 taken at the trains—before the milk had come into the possession of the city dealer. Out of these 112 samples four were found below the standard of butter fat and 40 below the standard of total solids. Thus, while the per cent. of samples below grade from all sources was only 7.9 per cent. the proportion of samples below grade in the milk and cream direct from the farmer, and before the wicked city dealer had an opportunity to tamper with it, was nearly 40 (39.2) per cent. These figures are the sufficient refutation of an assertion made with increasing frequency since the enforcement of the new milk ordinance has begun to disclose the principal and primary offenders. If the State Pure Food Commission will take care of the farmers the Bureau of Milk Inspection will continue its care of the city dealers.

**Typhoid Fever Statistics.**—Although the anticipated increase of typhoid fever has resulted to quite as great an extent as was feared (from the pollution of the city water several weeks since), it has not yet been reflected in the mortality. Nearly all hospitals report an increase of cases—the net figures being about 28 per cent. greater than for the previous week. But the typhoid deaths reported are decreasing.—only 8 during the week as against 11 the week before and 45 in the corresponding week of last year. Since July 1 the total typhoid deaths reported have been only 55 as compared with 133 between July 1 and August 16, 1902. With a higher temperature and the return of summer vacationists, however, the typhoid deaths will undoubtedly increase.

**Smallpox on the Increase.**—Ten new cases of smallpox were discovered and removed to the Isolation Hospital. Dr. Spalding, the Chief Medical Inspector, again dwells upon the fact that none of these had ever been vaccinated and that seven of the number were children ranging in age from two months to six years. Two of these died Saturday morning. "Why," asked Dr. Spalding, "shouldn't the law require parents to have their children vaccinated before the age of six years? Certainly these babies have as much right to live as children at the school age. The law requiring all children to be vaccinated before entering the schools has protected absolutely every school child from smallpox for a period of more than ten years. No vaccinated schoolchild has ever had smallpox. There should be a law passed without delay requiring parents under penalty to have their children vaccinated before the age of six months."

**Mortality Statistics.**—The week's mortality rate is again remarkably low. The 483 total deaths reported represent an annual rate of only 13.36 per 1,000 of population. This is 6 per cent. less than the rate of the previous week; 8.7 per cent. less than that of the corresponding week of last year and nearly one-fifth—18.3 per cent.—less than the average August rate of the previous decade.

## GENERAL.

**Yellow Fever in Texas.**—In view of the appearance of yellow fever at Victoria, Tex., about 70 miles from Monterey, on the line of the Monterey & Gulf Railway, the quarantine established here has been made more rigorous by the appointment of an additional force of guards by the State authorities. Both the State and Marine Hospital Service physicians are at present at Monterey investigating the rumor to the effect that yellow fever exists in that vicinity. The consensus of opinion is that a quarantine against Monterey will be established, and should such action be taken, it would mean a temporary tie-up of railway traffic.

**The Prevention of Malaria in Hongkong.**—A series of reports and minutes written between the years 1900 and 1903, says the *British Medical Journal*, by Dr. Thompson, of Hongkong, shows some of the results obtained by that colony in its campaign against mosquitoes. Dr. Thompson on his return from England in 1900 began a research into the prevalence of mosquitoes and malaria in the colony of Hongkong and in the new territory, and, after a careful examination of those districts, made a plan on which were depicted the various areas where mosquitoes bred. Many places were found suitable for the breeding of the insects, and of those the nullahs were the worst, one especially above Ripon Terrace passing the end of Nethersole Hospital being heavily infected with mosquito larvæ. Other areas, quite close to the Government Civil Hospital, the author thinks supplied *Anopheles* mosquitoes for the transmission of malaria from person to person in the hospital, and this is quite consistent with the conditions so often noted in other tropical countries. A large number of external examinations of mosquitoes showed that insects of the genus *Culex* greatly predominated, though *Anopheles* were also not uncommon. No note is made as to the numbers of those infected with malarial parasites, and this in the light of the India work on this subject is unfortunate. As a result of the researches into the breeding areas, a series of recommendations similar to those advocated by Major Ross in Africa, and by other observers in different parts of the world, were proposed. A second visit to the areas in 1902 showed that there was a distinct improvement, and further work was advised still to better their condition. In 1903 another survey again showed fewer mosquitoes, but here it may be noted that Dr. Thompson states that the measures adopted have only been temporary, and to be successful must be continuous till the nullahs are properly drained. It is a pity that no mention is made of any reduction or otherwise in the prevalence of malaria as a result of those measures, and it would be interesting in the future to have this point investigated. But Rome was not built in a day, and Hongkong is to be congratulated on what it has already done, and the hope may be expressed that it may go on energetically and do much more.

**Oysters and Typhoid Fever**—Dr. Bulstrode's official report on the oysterborne outbreaks of enteric fever which followed certain mayoral banquets last year, although anticipated by full reports by local medical officers of health, will be read, says the *British Medical Journal*, with great interest, if for no other reason because it coordinates the particulars contained in previous accounts, and gives a complete survey of the evidence on the strength of which these outbreaks were attributed to contaminated oysters from Emsworth. The title of Dr. Bulstrode's report is eminently cautious. It deals with "alleged" oysterborne enteric fever. The conclusion of the matter in the report is almost equally cautious, as will be seen from the following quotation (the italics are ours): "The foregoing narrative of facts would *seem* to establish the strongest possible *presumption* that oysters which had been deposited for a time at Emsworth have caused the outbreak of enteric fever and other illness which

followed the mayoral banquets on November 10 at Winchester and Southampton. A perusal of Dr. Bulstrode's admirable account of these outbreaks would, we venture to think, justify a more confident expression of opinion; and as this is a matter on which urgent administrative action and not merely an academical decision depends, and as in preventive medicine mathematical demonstrations of causative relationships are seldom if ever attainable, the words "*seem*" and "*appear*" which recur in the statement of conclusions in the report might probably have been omitted without sacrifice to accuracy, and with considerable practical gain. That this is so is shown by Dr. Bulstrode's own summary of the facts. Two mayoral banquets occurred on the same day in separate towns several miles apart. In connection with each banquet similar illnesses occurred, attacking approximately the same percentage of guests, and at corresponding intervals. At both banquets those who did not partake of oysters escaped, and all the guests who acquired enteric fever, and approximately all who suffered from other illness did partake of oysters. The oysters in question constituted the only article of food which was common to the guests attacked; and these oysters were all derived directly from the same source. Furthermore, oysters from the same source were at the same time, and in other places, proving themselves competent causes of enteric fever; and, we may add, these oysters were shown to be liable to serious contamination by sewage. The incidence of sickness on those who were guests at the two banquets is an interesting point. At Winchester 62 out of 134 guests suffered from some form of illness. Only two of these did not eat oysters. Ten of the guests had enteric fever, and all these had oysters. At Southampton there were 132 guests. Of these 55 became ill, out of which number 54 took oysters; 11 acquired enteric fever, all of whom took oysters. Dr. Bulstrode's remarks on the importance of epidemiological study of the origin of these outbreaks, and on the undesirability of trusting to bacteriological evidence alone, are eminently judicious. The whole report is an excellent example of careful and exhaustive inquiry, which may serve as a model to other investigators."

**Patent Medicines in Germany.**—The Federal Council of the German Empire, says the *British Medical Journal*, has drawn up a code of regulations regarding the sale of patent medicines in Germany, and has requested the Governments of the several States to issue orders, on the basis of its proposals, to come into force on January 1 next. The State of Hamburg has already acceded to this request. Prussia will shortly do so, and the other Federal States are likely to follow suit. Various well-known "panaceas" are said to be mentioned in the regulations among those which are to be prohibited.

**The Medical Profession in France.**—The *British Medical Journal* reports the case of a French doctor who was brought before a police court recently and sentenced to six months' imprisonment for petty larceny. When asked what had driven him to theft his reply was, "Hunger." He was dealt with as a first offender, and his friends have, we are pleased to say, established him in a respectable practice in a small town. The case has been used by the *Temps* and other newspapers as a text for disquisitions on the overcrowding of the learned professions in France. France has already, it is pointed out, too many doctors. Some statistics lately published by M. de Lavarenne show very clearly that this is the case. During the twenty-five years, 1876 to 1901, the date of the last medical census published, the number of doctors and *officers de santé* increased from 14,376 to 17,108. This increase was altogether disproportionate to the growth of population, for while in 1876 the ratio of practitioners to people was 2.90 per 10,000, in 1901 it was 4.08. These figures are still more instructive if we examine the distribution of practitioners throughout the country. In certain regions, especially in the departments of the Basses Alpes, Aveyron, Cantal, Charente, Corrèze, Creuse, Dordogne, Lot et Garonne, Haute Savoie, Tarn et Garonne, which have been greatly impoverished by a series of agricultural crises, the number of practitioners has diminished. On the other hand, in certain prosperous departments the number has greatly increased. Thus in the Bouches du Rhône there were 434 doctors in 1901 as against 370 in 1876; in the Nord 656 as against 456; in the Seine Inférieure 531 as against 412; in Seine et Oise 343 as against 244. The increase shown by these figures is very considerable, but in the Seine department it is far greater. While in 1876 there were 1,606 practitioners, in 1901 there were 3,281, the number having doubled itself in the twenty-five years. Of the 17,108 doctors 9,221 practised in rural districts having a total population of 27,595,528, while there were 7,887 in towns with an aggregate population of 11,366,417. In the towns themselves the distribution of practitioners was very unequal. Paris had 2,892 doctors for its 2,714,068 inhabitants, a ratio of 10.65 per 10,000. The cities of 100,000 to 492,000 inhabitants, with an aggregate population of 2,636,032, had among them 1,875 practitioners, a ratio of 7.4 per 10,000. On the other hand towns of 30,000 to 100,000 inhabitants which together made up a population equal to that of Paris had no more than 1,487 doctors, that is to say, 5.47 per 10,000. The proportion became less as the population of towns diminished. Thus those of 20,000 to 30,000 inhabitants, having an aggregate population of 1,297,058 had 635 practitioners—4.89 per 10,000; and the towns of 10,000 to 20,000 only had among them 1,010 doctors—5.08 per 10,000. In the country the average proportion of practitioners to populations was 3, while in Paris it was 11 to 10,000. From a recent unofficial estimate we learn that the total number of medical practitioners in France in the present year of grace is 18,735, being an increase of 1,627 as compared with 1901.

**Deaths in Europe.**—Among the members of the medical profession in foreign countries who have recently died are Dr. Oliveira Monteiro, Professor of Medicine in the Medical School of Oporto; Dr. Vacher, Mayor of Treignac, formerly Member of the French Chamber of Deputies, author of numerous works dealing with social economy and hygiene, aged seventy-one years; Dr. Bele, sometime Senior Surgeon to the Hospital of Maus, aged eighty-two years; Dr. Rudolf Trzebitzki, Professor of Surgery in the University of Cracow, aged forty-one years; and Dr. Julien Bouglé, Surgeon to the Paris hospitals, and one of the editors of the Archives Générales de Medecine, aged thirty-five years.

**The Continental Anglo-American Medical Society.**—The annual luncheon of the society was held in Swansea, at the Hôtel Metropole, on Thursday, July 30th, and was very successful in every way. Dr. Freeman (San Remo) occupied the chair and twenty-seven members and their guests were present, including Dr. T. D. Griffiths (the President of the Association), Dr. Frederick Roberts, Mr. Mayo Robson, Mr. Walter Whitehead, Mr. Ward Cousins, Mr. Arbuthnot Lane, Mr. Edmund Owen, Sir Patrick Manson, Professor Adami, Dr. F. Burghard, Mr.

Sheen, Professor Herman Senator and Dr. Reinhold Ledermann (Berlin), Dr. H. D. Rolleston, Mr. C. D. Marshall, Dr. Dawson Williams, Dr. Irving Cameron (Toronto), Professor Albert Saundby, Dr. Logan Turner, Dr. Creasy, Dr. Leigh Canney (Assouan), Dr. Michael Foster (San Remo), Dr. Sandwith (Cairo), Dr. Samways (Mentone), and Dr. Leonard Robinson (Paris). The speeches were short, as Mr. Mayo Robson had to leave early to give the Address in Surgery. After the Chairman had proposed the usual loyal toasts, Mr. Edmund Owen, in happy speech proposed "The Health of the Society," and said what a good thing it was to learn to know each in this friendly way, and thus become acquainted with colleagues abroad, who would do the best for the patients and even attend to the embalming or burial if necessary. Dr. Sandwith, of Cairo, returned thanks and hoped the Society would see many of the present company at the International Congress of Tuberculosis to be held in Paris in October, 1904. Dr. Michael Foster proposed the health of the guests, to which Dr. Frederick Roberts replied, saying what pleasure it had given him to be present, and he hoped to make the acquaintance of the remaining one hundred members at the dinner in Paris in 1904, when the Society will be, so to speak, at home with their own chef. A vote of thanks to the chair terminated the most enjoyable meeting.

**American Association of Obstetricians and Gynecologists.**—The American Association of Obstetricians and Gynecologists will hold its sixteenth annual meeting in the Northwestern University Medical School Building, Chicago, Ill., Tuesday, Wednesday and Thursday, September 22, 23 and 24, 1903, under the presidency of Dr. Lehman H. Dunning, of Indianapolis. The Auditorium Hotel Annex has been selected for the headquarters of the association, the management of which should be addressed concerning rooms and rates. Dr. J. B. Murphy, Reliance Building, 100 State street, is the chairman of the committee of arrangements and will gladly furnish any information to members and guests upon application. Dr. Murphy also can be addressed, relating to accommodations, at the Auditorium Annex, or other hotels. The following list of papers has been offered: 1. President's address, by L. H. Dunning, Indianapolis; 2. Supravaginal Amputation for Fibroids, with report of cases, by H. E. Hayd, Buffalo; 3. Traumatic Rupture of Intestines Without External Marks of Violence, with report of cases, by Geo. S. Peck, Youngstown, O.; 4. Ectopic Pregnancy, H. D. Ingraham, Buffalo; 5. Relationship of the Colon to Abdominal Tumors, by J. F. Baldwin, Columbus; 6. Cysts of the Kidney Resembling Ovarian Tumors, with cases, by Rufus B. Hall, Cincinnati; 7. Total Extirpation of the Vagina for Carcinoma, by Charles G. Cumston, Boston; 8. Surgery of the Female Bladder and Urethra, by John B. Murphy, Chicago; 9. Surgery of the Ileocecal Valve for Non-malignant Disease, by N. Stone Scott, Cleveland; 10. The Curette in Postpartum Infections of the Uterus, by D. Tod Gilliam, Columbus; 11. The Use of Veratrum Viride in Surgical and Obstetrical Practice, by Chas. L. Bonifield, Cincinnati; 12. Should the Uterus and Ovaries be Removed in Cases of Double Pyosalpinx? by C. C. Frederick, Buffalo; 13. Placenta Previa, E. T. Abrams, Dollar Bay; 14. The Limitations of Cæsarean Section, by E. Gustav Zinke, Cincinnati; 15. Further Notes on Ovarian Grafting, by Robt. T. Morris, New York; 16. Conservative Surgical Treatment of the Uterine Adnexa, by A. P. Clarke, Cambridge; 17. The Value of Vaginal Cæsarean Section, M. Stamm, Fremont, O.; 18. Hysteria as a Result of Chronic Atrophic Parametritis; a Contribution to the Study of Nervous Disturbances, by W. A. Freund, Berlin; 19. Anesthesia in Abdominal Surgery, by J. J. Gurney Williams, Philadelphia; 20. The Technic of Gynecological Work, by A. Vander Veer, Albany; 21. Emergency Abdominal Surgery at the Patient's Home—a Demonstration, by W. G. Macdonald, Albany; 22. Discussion of Common Causes of Death Following Pelvic and Abdominal Operations, by Joseph Price, Philadelphia; 23. The Indications and Technic of Vaginal Drainage for Suppuration in the Pelvis, by A. Goldspohn, Chicago; 24. Intravaginal Elongation of the Cervix, by M. Rosenwasser, Cleveland; 25. Appendicitis, by Walter P. Manton, Detroit; 26. Chloroform in Labor, by Edwin Ricketts, Cincinnati; 27. Study of the Symptoms and Surgical Treatment of Intestinal Perforation in Typhoid Fever, by W. D. Haggard, Nashville; 28. Symptomatology of the Pelvic Musculature, by Hugo O. Pantzer, Indianapolis; 29. Palliative Treatment of Cancer of the Cervix, by Walter B. Chase, Brooklyn; 30. Abdominal Versus Vaginal Hysterectomy in Carcinoma Where the Radical Operation is Warranted, by John B. Deaver, Philadelphia; 31. Hysterectomy in Infectious Diseases of the Uterine Appendages, by H. C. Deaver, Philadelphia; 32. The Scope and Limitation of Myomectomy in the Treatment of Fibroid Tumors of the Uterus, by L. S. McMurtry, Louisville; 33. In Memoriam—William E. B. Davis, L. S. McMurtry, Louisville; 34. Penetrating Gunshot and Stab Wounds of the Abdomen, with report of cases, by John Young Brown, Jr., St. Louis; 35. Report of Abdominal Section During Pregnancy, by X. O. Werder, Pittsburg; 36. Shortening the Round Ligaments by the Blunt Hook Method, by H. W. Longyear, Detroit; 37. The Gilliam Operation; a clinical contribution, by Edward J. Ill, Newark; 38. Report of a Fourth Consecutive Successful Operation for Acute Perforated Gastric Ulcer, with General Infection of the Peritoneal Cavity, by Henry Howitt, Guelph, Ont.

During the meeting Dr. J. B. Murphy, by request, will hold a clinic, at which some demonstrations of special interest will be made. Dr. Macdonald will give a demonstration of Emergency Surgery at the Patient's Home, showing operator, assistants, nurses and equipment in full detail, immediately preceding Dr. Murphy's clinic. All members of the medical profession are cordially invited to attend the scientific sessions.

**He's Got It Reduced to a Science!**—He was a doctor of the advanced school. He laid his fingers on my pulse, and, with his watch in his hand, gave it a fair start and observed it carefully all of the way around.

"Strong, 74," he said, in a moment. Then he consulted a card that was covered with figures and continued: "That equals 63," and he placed the number on a slate. "Put out your tongue. Good! That is 14," he said.

"Inches?" I asked.

"How is your appetite?" he inquired, ignoring my question.

"Equal to the supply."

"That makes 204," he replied.

"Can't you reduce it a little?" I asked, but failed to get his attention.

"Cold feet?"

"Yes," I answered.

"Three," he said.

"No, 2," I replied, to correct him.

He set the three under the other figures. He then placed a thermometer in my mouth, which he afterward consulted in connection with the card.

"A good 198," he said.

"Impossible," I suggested, mildly.

He wrote down the 198 and asked if I had headaches.

"Sometimes, in the morning, after being kept late at the office," I answered.

"Four," he said.

"Isn't that rather low?" I asked.

"Do you smoke," he inquired.

"Yes."

"Ten," he replied.

"No, two for 10," I said.

He put down the 10.

"Do you sleep well," he asked.

"That depends upon the baby," I answered.

"We won't consider that," he said.

"You had better call it 980," I suggested.

He added together the figures that he had placed on the slate.

"That makes 496," he said.

"Is that the amount of the bill," I asked.

"Bill?" he replied. That is the number of the prescription. I want you to know that medicine with me is no longer an experiment, for I have reduced it to a mathematical certainty. Every sympton has its number, and the sum of these numbers indicates the medicine that is needed. I have worked for fifteen years in formulating my prescriptions and perfecting the treatment, but I have it now. Your bill is $10.

I understood that number, and left the office feeling relieved and deeply impressed by the doctor's learning.—*Harper's Bazar.*

**Some New Data Concerning Smallpox and Vaccination.**—Professor C. E. A. Winslow, of the Massachusetts Institute of Technology, in writing for Science, reviews Dr. Edwardes' recent work on "A Concise History of Smallpox and Vaccination in Europe," and draws some interesting conclusions of his own. He thinks the enforcement of State laws in this country requiring primary vaccination would be attended with difficulty because of certain factors in the process which it is difficult to eradicate. In the past disease was often transmitted by the "arm to arm" method, but now with our purified serum and careful scientific manipulation we have limited such transmission to erysipelas and tetanus, and these are quite often secondary infections due to somebody's meddlesome intervention. Still, such occurrences are frequent enough to make compulsory vaccination of doubtful success. The article says: "No one now supposes that a single vaccination affords absolute permanent protection, and with the increase of vaccination there must naturally come an increase of cases among the vaccinated. The experience of Leicester, on the other hand, is certainly of interest. It shows that under certain conditions the dangers of neglected vaccination may for a time be braved with impunity by a considerable portion of the community. This has been so far accomplished by prompt reporting and strict isolation of cases, and, according to the Chairman of the Public Health Committee of the town by the fact that a handful of the population, including the medical men, sanitary staff, smallpox nurses, etc., are as well vaccinated in Leicester as in any other town, so that a cordon of protected persons can at once be drawn around any case of smallpox which may occur." However, one should remember that there was some protection afforded to the inhabitants of Leicester by vaccination previous to the adverse agitation. In the epidemic of 1892-5 198 persons out of 358 attacked had been vaccinated some years before.

The article further says: "The objection made to the hospital statistics, namely, that the deaths of the unvaccinated class are unfairly increased by the inclusion of doubtful cases, and those who have been vaccinated but show no scars, can scarcely apply to the commission's analyses. It will not, at any rate, have much weight, except with those who, like Mr. Wallace, believe that 'in this matter of official and compulsory vaccination both doctors and Government officials, however highly placed, however eminent, however honorable, are yet utterly untrustworthy.' With regard to the smallpox occurring in persons once vaccinated, there are two points to notice. In the first place, the ratio of deaths to cases is far lower than among the unvaccinated. Thus at the Leipsic city hospital in 1870-2, 99 died among 139 unvaccinated cases, 116 died among 1,504 vaccinated cases, and none among 13 revaccinated cases. Creighton and Wallace object to these statistics on the ground that the death rate thus apparent among the unvaccinated is obviously too high, because 'in pre-vaccination times the death rate (18.8 per cent.) was almost the same as it is now in the vaccinated and unvaccinated together. A single vaccination then greatly reduces the probability of an attack of smallpox, postpones it to a later period of life, and renders it less dangerous if it does ensue. To insure absolute protection revaccination is required; and its efficacy is well indicated by the experience of the Prussian army. In addition, one single bit of evidence may be adduced which is more striking, perhaps, than all the rest, the statistics of nurses in smallpox hospitals. These figures are of special interest because we have here a fairly large class of persons whose condition as to vaccination is accurately known, and who are uniformly exposed to the contagion of the disease; and the experience of two such communities is quoted by Dr. Edwardes. 'During the epidemic of 1871 there were 110 persons engaged in the Homerton Fever Hospital in attendance on the smallpox sick; all these, with two exceptions, were revaccinated, and all but these two escaped smallpox. Of 734 nurses and attendants in the Metropolitan Asylums Board Hospitals, 79 were survivors from smallpox attack—they escaped infection; 645 were revaccinated on entrance —they all escaped; 10 were not revaccinated, and the whole 10 took smallpox.' If statistics ever proved anything those quoted above prove the protective influence of vaccination. If any fact in science is certain, it is certain that a successful vaccination absolutely prevents smallpox for a period of some seven to ten years, that after that period it renders the disease less fatal, and that its complete protective effect may be renewed by revaccination."

**A Municipal Milkshop.**—Dr. William Robertson, medical officer of health, of Leith, Scotland, writes on the subject of municipal milkshops in an article for the County and Municipal Record, which is copied in a current issue of the *Sanitarian*. In the course of his article Dr. Robertson records the following observations: "I have always held most decided views upon the milk supply of towns, and the more I learn of the little ways of cow feeders the more strongly do I feel the need there is for a greater uniformity of action by various sanitary authorities throughout the country. That this uniformity does not exist can be demonstrated by touring different districts. . . . The fact that thousands of infants are dependent upon milk for their sustenance is a strong argument in favor of raising the level of excellence of our milk supply. I do not mean to say that the milk as it comes from the byre is always bad. There may be, and often are, in-

stances where the milk is taken into a dirty house, in which filthy dishes and foul bottles are requisitioned to store the milk. . . . Three years ago I visited St. Helens, and described in the *Sanitary Journal* what I saw at the milk depot. So impressed was I with the common-sense and educative value of the scheme that I, literally speaking, put it into my pocket for future use. Liverpool, Ashton-under-Lyne, and Battersea have now adopted the principle of feeding infants, and at each place the movement has been a signal success. Leith, as is well known, boasts of a low general death rate, but I found that the mortality among infants was unduly high. This fact was brought prominently before the local authority, and I was asked to report fully on the whole subject, and to offer recommendations to reduce the death rate among infants. A subcommittee went very fully into the report, and gave the matter most sympathetic attention. The result was a unanimous recommendation that a milk depot ought to be started. I may say I had, some weeks before, visited Liverpool, where three depots are in operation, and was able to guide the committee upon a probable line of action. When the subcommittee's recommendation came up before the whole Town Council I anticipated a revolt against the apparent attempt to municipalize a milkshop, but a very much broader view of the question was taken, and the subcommittee's recommendation was carried without a dissentient voice. To cut a long story short, a shop was taken in a central part of the burgh, at a rental of £20, and the necessary apparatus ordered. In Liverpool the operations, as I have said, are carried on on a very large scale. In one of the depots there are three large departments—one for cleaning bottles and sterilizing the milk, another for storing the milk and bottles, and a third, the front part of the shop, where the baskets are sold. In Leith the depot consists of a front and back portion. In front is the sterilizer and the shelves on which are kept the prepared bottles and baskets. The rear portion of the depot, screened off from the front, is where the bottles are washed and stored. . . . To keep down any feeling of jealousy on the part of the local cow feeders, it is my intention to take milk from them in rotation, giving each a month's supply. And as time goes on I hope to establish agencies in different parts of the burgh, so that orders may be received for the sterile milk. I think the dairymen will assist me to carry this idea into effect. What I have said refers to what one might call a tentative scheme. The success of the Leith depot is practically assured, for the medical practitioners are in entire accord with the scheme; and when the medical officer of health can claim the general practitioners as allies he can go on with his work with a very light heart and cheery confidence. In conclusion, I would only add that the effect of a milk depot to provide sterile milk for infants can neither be felt nor appreciated in a month. One must wait until the educative influence of the depot has taken root. The points that seem to appeal to parents as the result of using sterile milk are—first, that they have now no worry in making up bottles; secondly, fretful infants enjoy a rest at night in place of squirming with flatulence and pain; and, thirdly, several mothers have declared that the vomiting which was common has now almost ceased."

**Financing Smallpox.**—The *Times* editorially comments as follows: "Getting the smallpox in one's home town and exploiting its eruptive and succeeding stages elsewhere at the expense of reluctant Samaritans who, like the 'flowers that bloom in the spring, tra-la,' have nothing to do with the case except what is forced on them as a matter of self-protection, is a proceeding which is now exciting considerable municipal and legal attention in Connecticut, occurrences of the sort having of late been rather frequent there. A mother and daughter living in Stamford visited the neighboring town of Norwalk a year or so ago, and while there blossomed forth with unmistakable stigmata of the disease. They were promptly taken in hand by the authorities, sequestered, and in the course of several weeks doctored into health and sent home. All this involved expense, the amount considerably exceeding a thousand dollars, and this the Norwalk Selectmen asked the Stamford Selectmen to pay. No attention was given to the requisition. It was received in silence, which in this case did not give a cent. But as time wore on it became the subject of increasing prolixity of correspondence between the cities, bringing the matter no nearer to a settlement. Stamford flatly said it wouldn't pay; Norwalk referred the matter to its Town Council, who looked into it with the penetrating eye of a magpie looking into the hollow end of a bone, and decided that it constituted a valid ground of action. A suit was therefore brought, and it will be argued as soon as the courts reconvene after their summer vacation. The case will, then, no doubt, be considered in all its legal and perhaps its moral and ethical bearings, affording a precedent to rule future ones as they may arise. They have cropped up quite frequently of late, particularly in the respected Commonwealth named, and it is quite time that some authoritative judicial decision concerning them should there be placed on record. Stamford has had its own experience of caring for cases originating elsewhere, and has spent considerable money in looking after them. Citizen George Francis Train came there awhile ago from his New York abode and proceeded to break out all over, like a branch of the red, red rose, as if he had deliberately timed his arrival to synchronize with that crisis. He didn't want to be sequestered, or treated, but they took him in hand all the same and expended $1,900 in bringing him around to his normal non-contagious condition. He had spent many years of his life, then descending into its wintry period not void of a withering picturesqueness, in vindicating the principle that the peanut was a sufficient cure for all bodily and many spiritual ills, and in pursuance of his mission had consumed large quantities of this trivial but nourishing subterrene growth on the open-air benches of Madison Square. Thither, as year followed year, the children and the sparrows flocked to see him. It involved a surrender of his theory to admit that any other treatment in any crisis was necessary, and he only submitted to it under protest. None the less some of the Stamford Selectmen think that the town has a good case against the metropolis for reimbursal of its outlay and favor its vigorous prosecution. In their opinion, New York has no right to unload her smallpox cases, in full or partial development, on neighboring towns; moreover, she is rich and can afford to pay. Probably we have not yet heard the last of it—if we are to pay doctors' and nurse's bills for anybody involved in like conditions. The spectacular citizen and ideologist named is as well worth it as another, and even the vigilant obstinacy of our present Controller ought to relax when the bill comes before him, if indeed that stage of the proceeding be ever reached. There seems a measure of inconsistency on the part of the Stamford authorities in refusing to pay Norwalk's bill while suing another town for

another one incurred under the same conditions. The best culinary authorities have always held to the principle that what was sauce for the goose was also suitable basting fluid for the gander, and if Stamford is bent on getting back what it has expended in this way to the point of going to law about it it is difficult to see how she can reasonably stand up against Norwalk's contention and refuse to liquidate all the items of the smallpox account between them."

**Genius and Eyestrain.**—A recent leading article in *The British Medical Journal,* from one who knew some of the men, is of interest. We give it in full: "Lawrence Sterne was, in the words of Sir Thomas Browne, 'knaved out of his grave,' and his body was recognized on a dissecting table at Cambridge. The fleshly garment of the author of *Tristram Shandy* was doubtless dealt with as the chance treasure trove of the resurrection man; the idea of anatomizing genius had not been conceived in his day. Though Dryden has said that 'great wits are sure to madness near allied,' the intimate connection between genius and disease does not seem to have been suspected till comparatively recent times. It is true that poetry is said to have been defined by the French medical philosopher, Cabanis, as a disease of the small intestine, but no one seems to have succeeded in verifying the reference. Nowadays genius is, in Tennyson's elegant phrase, 'ripped up like a pig,' or rather it is scientifically dissected. Great men are everywhere knaved out of their graves. Sir Thomas Browne himself has shared the common lot; Beethoven's ear, Gayarre's larynx, the skulls of Cromwell and Richelieu, to mention but a few, have been scrutinized, probed, and measured. A book has been written on Gambetta's brain; the bones of St. Cuthbert and St. Thomas of Canterbury have been the subjects of anatomopathological research. In default of material for dissection, medical commentaries are written on the infirmities of genius—on Cervantes's cardiac dropsy, on Swift's 'vertigo,' on Napoleon's epilepsy and the 'itch' which is said to have afflicted him, on St. Teresa's hysteria, on Jean Jacques Rousseau's genitourinary troubles, on the pathological phenomena noted or inferred or suspected in Columbus, Petrarch, Tasso, Schopenhauer, and Goethe. That interesting collection of literary necropsies, *La Chronique Medicale,* ably edited by Dr. Cabanès, is a mine of information as to the illnesses of celebrated persons. So great is the interest taken in the physical infirmities of genius—using that word in the widest sense—that an elaborate monograph was written by Dr. Toulouse on Zola's constitutional peculiarities during the life of that writer. It is scarcely fair, perhaps, to class Dr. George M. Gould's *Biographic Clinics* with the works of the literary body snatchers to which reference has been made. While their object is merely the satisfaction of curiosity, his book is an important contribution to science. His study of the mysterious sufferings which nearly wrecked the lives of Carlyle, Darwin, Browning, Huxley, and De Quincey has been made with a serious purpose. Convinced of the far-reaching constitutional effects of eyestrain, he wished to illustrate his teaching by a series of striking examples. He has certainly succeeded in drawing clinical pictures of the greatest historical interest, which immensely increase the admiration we feel for the great men who achieved so much under conditions of difficulty and disability that would have crushed ordinary men. We frankly say that we do not think he has established his case by scientific proof; but this failure can scarcely be laid to his charge, for there is too slight a basis of fact on which to rest a solid conclusion. The evidence largely consists of the illustrious patients' own testimony, which, moreover, is given in casual remarks without any particular sense of responsibility. It must be borne in mind that Carlyle and De Quincey were markedly neurotic, and that Browning was a poet. Huxley, too, had a highly-cultivated gift of expression. Descriptions of their own sensations and sufferings made by such men in corespondence or private intercourse cannot be accepted without a considerable discount for unconscious or half-conscious exaggeration. We have heard that a famous orator who went over to the majority some years ago occasionally misled his medical attendants by the lurid colors in which he painted agonies which, as a matter of prosaic fact, there was good reason to believe he had not to endure. We are quite willing to admit that writers who must of necessity also be great readers, and a considerable part of whose work is the correction of proofs, are very likely to overuse and thus damage their eyes. But this is not what Dr. Gould means by eyestrain, which he holds to be due to astigmatism. It may further be granted, for the sake of argument, that astigmatism is responsible for the manifold nervous and gastric, hepatic, and other derangements which he attributes to it —that, in his own words, 'the whole system must often become the vicarious sufferer for the sins of the eye.' Even if we admit that 'at least 80 per cent. or 90 per cent. of headaches and a very large proportion of digestional or nutritional diseases are dependent upon eyestrain,' and that there are in the civilized world 'at least 10,000,000 to 15,000,000' victims of that infirmity, it does not follow that the individual men of genius whose biographical records Dr. Gould has studied were the subjects of astigmatism or eyestrain. This particular fact, we repeat, he does not seem to us to have proved, and, in the absence of definite clinical proof, his explanation of the sufferings of Carlyle, Darwin, and the others, ingenious and plausible as it undoubtedly is, is merely 'bookish theorick.' We confess we have but little faith in master keys which unlock all the secret chambers of pathology. Some years ago the nose was declared by some to be the cause of nearly all the ills which afflict mankind. Now the eye is put forward as a rival: with a little ingenuity we have no doubt that a good case could be made out against the ear. We can easily imagine Hogarth's 'Enraged Musician' the victim of a devastating storm of reflex disturbances. If Dr. Gould's theory be true, nine-tenths of the illness not only of geniuses but of common folk would be cured as by a magician's wand by properly fitting glasses. The world's eyes are out of joint, he says in effect, and spectacles are the only wear. Only they must be made in America. To sum up: While fully recognizing the importance of Dr. Weir Mitchell's discovery that eyestrain is often the unsuspected cause of headache and other disorders, and the practical value of the labors of Dr. Gould and his fellow-workers in developing that discovery, we think that the case has been overstated to such an extent as to make its acceptance by reasonable men very difficult, if not impossible. Dr. Gould thinks statistically in millions as Cecil Rhodes, according to his admirer, Mr. Stead, thought in continents. Largeness of view is an excellent thing in medicine as in other things, when it does not lead to neglect of detail. Medical science, however, is built not on theories but on facts."

**Obituary.**—Dr. W. S. Playfair, the noted specialist and authority on obstetric medicine, died at St. Andrew's, Scotland, August 13. Dr. Playfair was born in 1836. He was a son of the late George Playfair, Inspector-General of Hospitals in Bengal. His education was obtained at St. Andrew's, and the young physician then became an assistant surgeon in the Bengal army in 1857. After teaching surgery for the year 1859-60 in the Medical College of Calcutta, he returned to London and practised there till his death. He was professor of obstetric medicine in Kings College, consulting physician for the diseases of women and children at the Kings College Hospital, and physician accoucheur to the Duchesses of Edinburgh and Connaught. He was a member of the Athenæum Club. Among his publications were 'The Systematic Treatment of Nerve Prostration and Hysteria'; a 'Handbook of Obstetric Operations,' and 'A System of Gynæcology,' which he jointly edited with Prof. Clifford Allbutt of Cambridge.

## CORRESPONDENCE.

### OUR LONDON LETTER.

(From Our Special Correspondent.)

London, July 25, 1903.

PHYSICAL DEGENERATION OF THE BRITISH RACE—WOMEN DOCTORS IN ENGLAND—HIGH FREQUENCY CURRENTS IN CANCER—THERAPEUTIC APPLICATIONS OF RADIUM.

We are at present in the throes of one of our periodical spasms of alarm about ourselves. At one time we are told that our trade is leaving us and that Germans are driving us out of the commercial field; another time we are being elbowed out of China by Russia; then our population is becoming stationary; now we are degenerating in physique. That there is some truth in the last notion is shown by a Memorandum that has just been issued by Sir William Taylor, Director General of the Army Medical Service. In that document it is pointed out that although statistics certify to a progressive improvement of the national health, and although athletic records are constantly being broken in regard to all sorts of feats of strength, agility and endurance, it is nevertheless true that a very large proportion of the men who offer themselves for enlistment in the Army are found to be physically unfit for military service. It was recently estimated by General Sir Frederick Maurice that out of every five men who offer themselves for enlistment there are at the end of two years' service only two remaining in the Army. Some are rejected by the recruiting officer; some by the examining medical officer, while others though enlisted are discharged after three months' trial as unlikely to develop into effective soldiers. That is to say, at the end of two years not more than 40 per cent. of the men who wished to become soldiers are actually serving; or, in other words, 60 per cent. of the men who offer themselves for enlistment are physically unfit to serve. This statement suggests the reflection, If these men are unfit for military service, what are they good for? Sir Lauder Brunton, a member of a Committee which has recently been investigating the physique of the rising generation of Scotland asks the same question with regard to the civil population: "Poor in physique as they all are, and poor in mental capacity and power of application as many of them must be, what becomes of them? Many of them probably marry girls as weak as themselves and have children, some of whom go to swell the lists of infant mortality; some to join the criminal classes, while others grow up more weak and incompetent than their parents." The Director General says that, whether the physical deterioration is partly the consequence of unskilled labor flocking from country districts into towns and there failing to find the means of properly rearing a family, or whether it be due to causes that can be remedied, such as too early marriages and the ignorance of the elements of hygiene on the part of mothers, the result is that among the male adolescents of all below the artisan class, a vast number are of a very low standard of health and physique. Every year there is published in the Report of the Army Medical Department a table in which the recruits examined are classified according to their previous occupations. Analysis of a series of these tables shows that the bulk of British soldiers are drawn from the class of unskilled laborers, that is, from the stratum of the population living in poverty. The recruiting statistics for a period of ten years (1893-1902) shows that the number of men medically examined for enlistment was 679,703 of whom 234,914 were rejected as unfit, giving a rejection ratio of 34.6 per cent.; of the men passed as fit 5,849 broke down within three months after enlistment being at the rate of .9 for this class, while 14,259 or 2.1 per cent. more were discharged as invalids under two years' service. Adding together the rates of rejection for the three classes, it will be found that 37.6 per cent. of all the men examined during the decennial period in question proved to be unfit for military service. It must, however, be borne in mind that these figures do not represent anything like the total number of rejections. A large number of men are rejected by the recruiting officers; these are not medically examined and do not appear in any returns. The Director General evidently thinks that Sir Frederick Maurice's estimate of a total proportion of 60 per cent. of rejection is not far from the truth. Examination of the statistics relating to the causes of rejection of men seeking enlistment by medical officers shows clearly that the majority are rejected on account of causes indicating poor physical development, namely, deficient chest measurement, deficient height and deficient weight. The causes of the decay in the British physique are only too obvious to those who know the conditions under which unskilled laborers, whether in country or in town, have to live in "Merrie England." The problem is an old one: "How is the multitude to be fed?" And further, how is it to be housed in a manner that shall satisfy the demands of common decency and the most rudimentary hygiene? The Director General seems to think that the causes of our physical degeneration have yet to be discovered, for he suggests that an inquiry on the subject should be made by a Commission "As to the composition of which the advice of the College of Physicians and Surgeons might be asked." The suggestion shows a singular confidence in the wisdom of two bodies whose advice in regard to public matters has always been marked by deplorable inaptitude. It was the College of Physicians which in 1867, in the face of the evidence contained in its own report, informed the Government of the day that leprosy was not contagious, a statement which led to the relaxation of measures of precaution throughout the colonies where the disease is endemic. The fitness of the Colleges for dealing with questions requiring even the smallest degree of breadth of view and practical statesmanship is sufficiently shown by the fact that at the present moment they are giving all their energies to an endeavor to defeat the efforts of the General Medical Council to make the five years' curriculum a reality and not a sham. A Commission has already investigated the question of the physical degeneration of Scotsmen, and nothing practical has so far come of its labors. Those of a Commission such as is suggested by the Director-General will doubtless have a similar result,

for, as Lord Salisbury said with cynical candor, no one—and least of all the Government—pays any attention to the recommendations of a Royal Commission.

A niece of Mr. Joseph Chamberlain was recently appointed resident physician at the Royal Free Hospital in this city with which the School of Medicine for Women is in organic communication. This year the school has 230 students, a fact which would seem to show that there is an increasing demand for the services of female doctors. There are now some 115 fully-qualified women practising medicine in London. According to a daily paper "in Wimpole Street there are seven, all, it is understood, with lucrative and increasing practices. Harley Street has four lady doctors," The streets named are two of those where doctors most do congregate, but it by no means follows that the fact of having a brass plate on the door of one of the mansions of these gloomy but fashionable thoroughfares implies a lucrative practice. At the New Hospital for Women, there are two lady doctors on the consulting staff, and thirty-three acting and visiting physicians and surgeons. There are female medical officers at the Canning Town Hospital, Blackfriars Provident Dispensary, Church Army Dispensary, Homer Street, and at the Institution for Diseases of the Eye at Fulham. At the Clapham Hospital, Jeffreys Street, the medical staff includes two ladies. The honorary acting physician at the Midland Hospital, Birmingham, is a lady, and there are visiting or resident lady physicians and surgeons at hospitals in Manchester, Edinburgh, Glasgow, Dundee, Hull, Bristol, Birkenhead and Oxford. Notwithstanding all this it is extremely doubtful whether the movement for admitting women to the medical profession has so far been justified by success in this country. There are several women who earn a respectable living and one or two who have what would be called in the case of a male consultant, a third or fourth rate practice. A few have cooperated in scientific investigation, but not one has independently made a discovery of any note or an original observation of any particular value. There are two or three ladies who operate with fair skill, but not one who has achieved anything like brilliant success in that line. The case is fairly put by a well-informed writer in a recent number of the *Cornhill Magazine*: "It is now many years since the obstacles which debarred women from entering the profession were removed, and the prejudice which the idea of a woman practising medicine aroused a generation ago is now well-nigh extinct. In London, in the North of England, in Scotland, in Ireland, and in Wales alike, the door is open and women have no difficulty in finding the best of professional education. In the University of London, as well as in Manchester and in the universities of Scotland and Ireland, a surprising number graduate each year and acquit themselves as creditably as their masculine *confrères*. Some reserve, however, must be observed in recommending the medical profession as a career for women. India has undoubted need of women doctors and absorbs a large proportion of each batch of graduates; but, so far, there are few signs that any large public demand has been created for them in their own country."

Quacks, like the poor, we have always with us, but at the present time the cancer quack is more than usually prominent in the newspapers here. The most pushful among them are, I am sorry to say, legally qualified members of the medical profession. These men somehow manage to get the most shameless puffs of their methods and results inserted in leading papers. When charged with unprofessional conduct, the injudicious friend is put forward as the offender, and the official censors of the morals of the profession are helpless. The "high frequency current" is now the most popular of quack cures for cancer, and as nobody knows much about its effects it is not easy to expose the hollowness of their pretensions.

Attempts to warn the public are practically useless because they are put down to the jealousy of the doctors who are credited with the desire to suppress all knowledge but that which is the property of their own craft or "mystery." Not long ago an enthusiastic lady sent the following letter broadcast throughout the land. As far as I am aware it has not yet seen the light but I think it deserves publicity. I suppress the name of the writer and of the doctor whom she advertises:

"You ask me to tell you more about that new treatment for Cancer of which I spoke in our mutual friend's drawing-room, but as nearly everyone who was present has made the same request, I am having an answer printed to send round to friends. It is called the 'High-frequency treatment by electricity; not the '"X" Rays,' not the 'Finsen Light' so successful in the cure of Lupus—but a much newer thing only discovered during the last few months. I hasten to add at once that it gives no pain, no discomfort to the patient—rather indeed, a pleasant feeling of exhilaration. By the exceeding force and strength of its oscillations (120,000 per second, equal to 1,000 volts) it kills the germs of the disease, causing the fibers and feelers running to the cells to, so to speak, loose their hold or grip, thus preventing them from sucking up fresh nourishment and generating new life. Consequently, they gradually begin to perish, to wither and to shrivel away. No medicine ever yet invented can do this, no knife yet made either. You ask me why? Because, though a knife may cut away the body of the disease so that it may heal *for a time*, it cannot possibly reach and cut out all these fibers and feelers with their tentacles—or whatsoever they may be—which, still embedded in their cells, suck up nourishment and generate new life and form a new body. The knife may give these fibers a sort of little shock *for a time* which allows the surface of the wound to heal *for a time*, but the germs soon begin to get active again and to work new mischief. The tremendous power of this new 'high-frequency' treatment kills these germs at the very root of their cells. I wish I could put it more scientifically and technically. It is being practised successfully at some hospitals, but very few private doctors have yet been able to go in for it, as the complete apparatus is not only enormously expensive, but so very few medical men are deep students of Electricity, with all its vast possibilities. However, one of the first and foremost of these 'few' is, as I told you, ——. He goes, and has gone from the beginning, heart and soul into it, from the time the 'X' Rays were first started, has kept pace step by step with each new discovery, and has the whole apparatus in full working order in his own house. I may just mention too, that one of the most useful points about the treatment is that it never fails to alleviate and soon remove the agonizing pain; while in cases of disorders of the nerves and depression of spirits it is wonderfully efficacious. I do think it is everyone's duty to spread such valuable information far and wide. Do not you?"

A copy of this letter was sent to the King who with characteristic good sense merely acknowledged its receipt and caused the writer to be informed that he had sent it on to the College of Physicians, the President of which, Sir William Church, is also the President of the Cancer Research Fund. About the same time an article appeared in Mr. Astor's paper, the Pall Mall Gazette, in which the marvellous effects of the "new" treatment—described as "a triumph of electricity"—in the hands of the same man were vaunted in the most flamboyant style. This moved Sir William Church to point out that the doctor thus presented to the world

as a scientific pioneer and a medical savior of society had not the slightest claim to be considered the inventor of electric currents of high-frequency, or as the originator of the application of such currents for the relief of pain or for the treatment of disease; high-frequency currents having been in use for these purposes for several years. He challenged the bepuffed practitioner to submit any evidence he might have collected as to the value of high-frequency currents in the treatment of cancer to the Cancer Research Association. It is needless to add that the challenge was not accepted. But not long afterwards one of our papers—The Daily Mail—which models itself on your yellow journals thrilled the country with the announcement that the Royal Commission on Cancer was about to present a report in which high-frequency currents would be recommended as the most effective treatment. This statement, obviously inspired by some of the charlatans who are "running" the treatment, was at once shown to be a pure fabrication and a very clumsily constructed one, inasmuch as no Royal Commission has ever been appointed to investigate cancer and consequently the report and its recommendations were alike imaginary. There are some earnest and honest men who are making a trial of the high-frequency currents, but it is difficult to get information about their work. I am informed that one of our foremost dermatologists has obtained remarkable results by the method, but as he does not yet know how the treatment acts or in what cases it is likely to be efficient, he does not care to publish anything on the subject at present. I have also heard of an apparently complete cure of uterine cancer in a case under the charge of a well-known gynecologist whose reputation for perfect integrity no breath of slander has ever dimmed. On the whole, however, the experience of those who have worked in a really scientific spirit with the high-frequency currents in this country may be summed up in the words of our leading authority in that line, Dr. John Macintyre, of Glasgow, who said not long ago that although the treatment had good constitutional effects and occasionally produced some amelioration of local conditions, he had never seen any case of cure of cancer by this method.

The same careful observer has lately been experimenting with radium. His conclusion is that it cannot be doubted that the salts of radium have an action on diseased tissues, but it cannot yet be said whether they will take the place of some of the other forces, such as X-rays, etc., at present employed in the treatment of lupus, rodent ulcer, and superficial epitheliomata. All that can be said is that something emanates from the compounds of radium which has a very exciting effect and, if pushed far enough, even a destructive power on healthy tissues. The method which he employs is to have the radium enclosed in a small cell with a mica front ½ inch in diameter. This is surrounded by a small piece of indiarubber tube. He has a number of cones made with an opening at the apex into which the indiarubber fitted. They vary in size and depth, but those chosen are usually about ½ inch in depth. The radium is applied to the parts for a period of twenty to forty minutes daily or longer, and the effects on the patients are watched with comparatively little risk. In a case of lupus of the back of the hand the application of radium caused disappearance of the lesion in three weeks; and in one of lupus of the nostrils and nose healing took place in four weeks. Recurrence, however, was observed within two months. In a case of rodent ulcer still under treatment, improvement has been noted. Mackenzie Davidson of the Charing Cross Hospital has confided to a reporter of the Daily Express that he has had strikingly successful results with radium in cases of "cancer," that is to say rodent ulcer. As to deep tumors he said he could not speak, but he let it be understood that he is hopeful. Although he allowed himself to be interviewed by the representative of a newspaper not particularly trustworthy in matters of science Mackenzie Davidson is a thoroughly sound man. Otherwise I should not refer to his work. It is suggested by Mr. Soddy, assistant to Sir William Ramsay, one of the discoverers of argon, that the "radio-active emanations" of radium and thorium may be applied by inhalation to the lungs of sufferers from consumption. We are, it seems to me, like Cortes and his men when, standing upon a peak in Darien, they first beheld the Pacific.

## EVIAN-LES-BAINS.

French Savoy, August 6.

*To the Editor of the* Medical News:

Dear Sir: The season at charming Evian-les-Bains is now in full swing. It is surprising that a spa which unites so many advantages, of location, climate, excellent mineral waters and artificial attractions, is so little known in America. According to the writer's observation the ubiquitous Yankee tourist simply takes a little run over to Evian from Geneva or Lausanne, strolls along the quay Baron de Blonay, and is off on the next steamer. A few American dyspeptics and sufferers from renal and hepatic disorders are found among the large number of valetudinarians, but not near so large a proportion as one sees at other European watering places affording less promise of benefit.

Evian-les-Bains is located on the east shore of the Lake of Geneva, on the Paris, Lyon and Mediterranean system of railways, about 625 kilometers from the French capital. It may be reached in two hours by rail, and in a slightly longer time by steamer from Geneva. The season extends from May 15 to October 1, and the prescribed time of treatment is from twenty-five to thirty days, according to the direction of the physician. The strict surveillance exercised over the health-seeker at the Geneva spas is somewhat relaxed here, the pleasure-loving Latins evidently not being able to tolerate so rigid a régime. It is not to be doubted, however, that excellent results are obtained at Evian. The daily routine is about as follows: Rising at 6 o'clock (the sun in July and August is 1½ to 2 hours high at that time) drinking one or two glasses from the Lower Cachat, taking the bath or douche during morning or afternoon hours according to doctor's orders. A promenade or enjoying the music at the Cachat. At 8 o'clock breakfast; at 10.30 coffee and dominoes at Casino. Concert from 3 to 5 P.M., followed by promenade. Table d'hote at 6, and at 8 grand concert at the Casino or the play at the theater. One may vary this routine by a sail on the lake. A little walk to the rising ground just back of the lakefront where a magnificent panorama of Mont Blanc, the Dent du Midi and other Alpine summits may be had, or in driving, fishing and various other diversions. At the magnificent Institut Hydrotherapique, recently completed, besides the various forms of hot and cold baths, sprays and douches one finds an excellent gymnasium and a very elaborate electrotherapeutic and mechanico-therapeutic plant. The hotels are numerous and very comfortable, some indeed quite luxurious. The best accommodations may be had at prices ranging from 8 to 15 francs per day for board and room. An almost ridiculously low figure to the American traveler accustomed to Saratoga and other high-class resorts in the United States. The Lower Cachat, which has been in constant use since 1789, is the principal mineral water fountain. The latest reliable analysis made in 1892, by Willm, of Lille, is as follows, estimated in grams per liter:

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|---|---|
| Calcium carbonate | 0.1960 |
| Magnesium carbonate | 0.0816 |
| Sodium carbonate | 0.0056 |
| Calcium and iron phosphate | 0.0008 |
| Sodium sulphate | 0.0079 |
| Potassium sulphate | 0.0052 |
| Sodium chloride | 0.0030 |
| Sodium nitrate | 0.0029 |
| Silica | 0.0142 |
| Lithium iodide | Feeble traces. |
| Carbonic acid as bicarbonates | 0.2627 |
| Carbonic acid, free | 0.0105 |
| Total fixed matter per liter | 0.3172 |

From 5 to 15 glasses are taken daily in accordance with the instructions of one of the medical attendants at Evian, of whom there are a dozen or more. The water is very pure and limpid and sparkling.

The analysis shows a very excellent alkaline-carbonated water with ferruginous properties. We have many such in America. If better results are obtained at Evian than at most American spas, it is not due to the superiority of the water, but to the fact that long years of observation and experience have taught the medical men of France that the use of mineral waters is only supplementary to temperate habits, careful diet, etc.

The time is not far distant, the writer trusts and believes, when our own beautiful spas, uniting all the natural attractions which this old earth can afford, will find their proper sphere in medical practice and popular esteem. J. K. C.

## SOCIETY PROCEEDINGS.

### BRITISH MEDICAL ASSOCIATION.

*Seventy-first Annual Meeting, Held in Swansea, July 28, 29, 30 and 31, 1903.*

(Continued from Page 336.)

**Discussion on the Vaccination Acts and the Prevention of Smallpox.**—Dr. McVail said: "Coming closely to the subject of discussion, the question of vaccinal legislation presents so many aspects as to make it almost impossible to do more than indicate the principal points that call for consideration. But perusal of the weekly reports in the *British Medical Journal* of smallpox in the provinces during the recent widespread prevalence of the disease suggests the importance of obtaining under Act of Parliament special powers for meeting special difficulties. When the country is threatened by cholera or plague the Local Government Board is in the habit of using its powers under the Public Health Act to bring into operation various provisions which are at other times in abeyance. Similarly, when smallpox threatens, the Board should be in a position to issue epidemic regulations either to the whole country or to a defined area. Such regulations should be perfectly definite in scope and purpose, and should at no time be open to the charge of being framed ultra vires. One matter of special importance with which the regulations ought to deal is the prevention of the spread of smallpox by tramps or vagrants. The part played by such people in conveying the disease has long been known, but has lately been much emphasized. Their migratory habits make it very difficult to procure anything like universality of vaccination of their children, or revaccination of their adolescents and adults. At the same time the opportunities which they have of carrying the disease from village to village and from town to town make them a most serious danger to the nation. The question is what exactly should be the measures enforcible on them. If we assume that next year will see the passing of a Revaccination Act subject to an exemption clause, should tramps who have been in contact with smallpox and require vaccination be excluded from the operation of the clause? In other words, Should compulsory vaccination in their case be absolute? To such a question one naturally replies with an emphatic affirmative, but on consideration I doubt if it would always be found a practicable measure. Even if contacts have chanced to stay on in a lodging-house until the case of smallpox to whose infection they have been exposed has been discovered, the time required to set in motion actual compulsory powers of vaccination, say, by order of a magistrate, might give the variolous disease too long a start to permit of its being overtaken. But quite possibly after exposure to smallpox a whole lodging-houseful of tramps may have distributed themselves all over the country before the existence of the disease had been recognized. In fact, if Parliament is to take any action of this sort, such powers should apply, not merely to tramp contacts, but to all tramps within the scheduled area of the epidemic regulations. Wherever found their vaccinal condition should be ascertained and recorded, and if necessary they should be vaccinated. It can readily be conceived that during smallpox prevalence local authorities may be more anxious to get rid of tramps than to obtain them for vaccination. If there is a risk in their thus being posted on from union to union it might be got over by charging the cost of their vaccination on a wider basis than that of the union—say that of the county, or of the whole area under epidemic regulations—an area which might sometimes be the whole country.

"But quite possibly the legislature may not, even under restrictions of time and place, exclude vagrants from the operation of any generally applicable exemption clause. In that, as in the entire domain of obligatory vaccination, Parliament must, of course, do just as it pleases. If it will not actually enforce the vaccination of vagrants, is there any useful alternative? In recent years tramps under vaccination in lodging-houses have sometimes received from local sanitary authorities a few days' board and lodging. The right to offer this without any question of subsequent surcharge by a public auditor should be definitely conferred by statute. With regard not to tramps in general, but only to tramp contacts, the further suggestion arises whether, in the event of their refusal to accept vaccination, or of the time being obviously past to make smallpox prevention probable, there might be a regulation for their compulsory detention until the incubation period of the disease had gone by. That would sometimes be a very useful measure, and possibly Parliament might sanction such a degree of interference with the liberty of the subject. The usual steps to prevent spread of infection immediately by means of clothing or person would, of course, be taken in every case.

"Under epidemic regulations there ought further to be the amplest powers, not merely for inspection of every place resorted to by vagrants and navvies, whether or not such place be registered as a common lodging-house, but also for the examination of all persons found in such premises, even in the absence of any special reason to suppose them suffering from smallpox. In the Public Health (Scotland) Act of 1897, Section 45 enacts that the medical officer of health may in the daytime enter and inspect any house where he has reason to believe that any infectious disease exists or has recently existed, and may examine any person found in such house. This power to examine persons in addition to premises should, under the regulations, be given independently of actual suspicion of the existence of smallpox in the house. Needless to say, such

a right of examination of apparently healthy persons would constitute a considerable interference with personal liberty. Whether Parliament would grant it I have no idea. Our point is that it would be useful for the detection of smallpox and for the ascertainment of the vaccinal condition; but if the legislature would prefer to risk smallpox rather than confer the power, then it is not we who would have cause to grumble. Once more our advice would be justified by the results either of its acceptance or of its rejection.

"Concerning the relation of the private medical practitioner to official vaccination there are differences of view. I think myself that if a fee were paid for every certificate of vaccination complying with a standard of area and number of marks to be prescribed by the Local Government Board, the effect would be to promote the practice of efficient vaccination without the formal appointment as public vaccinator of every medical man who might choose to apply. If certificates were to be paid for, false certification should be a heavily punishable offence. At present public vaccinators are under serious hardship in being merely contractors dismissible at four weeks' notice, and without any proper official status. This should be remedied in any new legislation. If systematic vaccination and revaccination are to be obligatory, then the evolution of the public vaccinator ought to be toward whole-time service, and, at reasonable salaries, that system ought to be economical as well as efficient. It would not come into force all at once, but as appointments become vacant areas could be combined under one officer."

**The Midwives Act of 1902.**—J. Ward Cousins said: "Up to the first day of April, 1903, any uneducated woman, without any training or experience, could style herself a midwife, and practise as one in any part of England and Wales. This statement is correct; and it appears hard to understand that our country should have so long been behind other European nations in seeking legislation for protecting the lives of women of the humbler class who are unable to obtain skilled help in the hour of danger. The Midwives Act of 1902, there is every reason to hope, will steadily wipe out the ignorance and incapacity of the past. It provides a Central Midwives Board to regulate the training of midwives, the issue of certificates after examination, and the annual publication of a Midwives Roll. Moreover, the Board is empowered to regulate and restrain within proper limits the practice of midwives, and the carrying out of all the provisions of the Act, with the approval of the Privy Council. After April 1, 1905, no woman will be able to style herself a midwife unless certified under the Act. After April 1, 1910, no woman will be allowed to practise for gain as a midwife unless she is certified as the Act provides. Up to March, 1905, women holding certain certificates mentioned in the Act, or other certificates approved by the Midwives Board, may claim to be certified. Women also who can satisfy the Central Board that they have been in actual practice as midwives for at least one year prior to July 31, 1902, and that they bear a good character, may claim to be certified under the Act.

"Now, the largest number will be admitted as midwives, and will be placed on the first roll, belong to the third class, and many of them will have been very imperfectly trained. Now, let us hope that the local supervising authorities throughout the country will be able to find some means of helping these women to obtain an increase both of knowledge and efficiency.

**Local Supervising Authorities.**—"The Midwives Act is to be carried out by the important process of decentralization. Every council of a county or county borough throughout England and Wales is the local supervising authority over midwives, but these bodies can delegate their duties to committees or to the district councils. The provision for carrying out the Act by the help of local bodies is a very helpful and practical method. Local bodies are well able to do the work and look after their own interests, and it is my opinion that the success of the Act will greatly depend upon the work done by the local supervising authorities.

"The local authorities may delegate their powers to a committee consisting wholly or partly of members of the council. The Act wisely permits also the appointment of women members on the committee, selected by the council, and as the Act principally involves the interests of women, it appears very desirable that the authority should secure the services of two women at least who are recognized workers and conversant with the needs of the locality.

"In Sweden the midwife has to be examined every year by the officer of health of the district as to the state of her knowledge in the presence of witnesses, and should her knowledge on any material subject be found deficient she can be suspended for a period from practice.

**Duties and Restrictions.**—"The midwife by the Act is permitted to attend normal labor only, and she is compelled to send for a qualified registered practitioner in every emergency. Her ability to recognize danger and abnormality in either mother or child will be an important test of her training and efficiency.

"The midwives in Switzerland are required to make a solemn affirmation on receiving their certificate. They promise on oath to practise their profession with reverence, patience, and earnest endeavor, and on every occasion to send for a physician in all abnormalities and also to abstain from intermeddling with his duties. If any midwife outstrips her powers in practice she can be fined from 10 to 1,000 francs.

**Midwives and the Prescribing of Drugs.**—"I shall now refer to a subject on which I find there is great difference of opinion. Some consider it sufficient for a midwife just to enter in a book every occasion on which she is under the necessity of administering any drug, whether scheduled as a poison or not, the dose, and the time and cause of its administration. Others are of opinion that the safety of women will be endangered if active remedies are placed in the hands of any one but registered practitioners. They consider that any ordinary remedy that the patients themselves would take may be suggested by the midwife; that in a great emergency, whenever an active drug is administered, the case must be considered abnormal and a practitioner must be consulted. Can, then, the administration of morphine, opium, or other dangerous remedies be placed at the discretion of thousands of unqualified persons who are only certified for attendance upon normal labor, without involving the safety of the public?

"In Sweden midwives are allowed to give some ordinary remedies, but they are bound by law not to order any active medicine for either the mother or the child without calling in a medical man.

**Notification.**—"The duty of notifying an infectious fever must be undertaken by the registered practitioner who is called in by the midwife to attend the case. Medical men are required to notify puerperal fever and other infectious disorders. The midwife does not diagnose the disease, but sends for the doctor on the occurrence of urgent symptoms. The record of the midwife will show the number of cases of fever which have occurred in her practice, and the name of the doctor who assisted her. Information of all cases of

fever ought to be forwarded at once to the local supervising authority, and also to the county medical officer of health.

"After any attendance upon a patient suffering from puerperal or any other illness supposed to be infectious, the midwife must disinfect herself, her appliances, and have her clothing thoroughly disinfected before going to another case. The local supervising authority may suspend a midwife from practice if suspension appears necessary to prevent the spread of disease. In Sweden a midwife must abstain from practice for a week after attending puerperal fever, and live as much as possible in the open air.

**Stillbirths.**—"The number of cases of stillbirth in any area is at present unknown, and we can not attempt to ride over existing legislation. The midwife has no power to grant any medical certificate or any certificate of stillbirth or death. Her record, however, will show the number of cases of stillbirth that she has attended, and this number will be considered by the local supervising authority. In this way the total number of stillbirths attended by certified midwives within any area can be readily ascertained. Beyond this voluntary information nothing can be known, and for the present we must wait for the amendment of the law as to death certification and registration. Stillborn children are too easily disposed of, and no doubt many evils and irregular practices are hidden which ought to be investigated. Let us hope that the successful working of the Midwives Act and the records of the local supervising authorities may turn out to be the successful insertion of the thin end of the wedge of progress.

**Improved Household Sanitation.**—"The educated midwives will help their patients to put in order their houses and carry out sanitary precautions for their own protection. They will teach personal cleanliness and the value of cleanliness at home, and, as far as possible, they will surround their patients with sanitary precautions. I believe that the work of midwives in promoting reform in the houses of the poor will have a wide and wholesome influence. They will be brought face to face with the question how best to deal with overcrowded and insanitary areas, and their efforts will tend to create a broader interest in the subject of rehousing the poorer classes under new conditions which will benefit their health and arrest the spread of disease. Interest has been recently manifested by the activity of many members of Parliament, by the introduction of projects for remedial legislation, and by the work of many voluntary associations, and I think it is not too much to hope that indirectly the silent work of educated midwives will prove a wholesome stimulus to the higher classes of society and arouse their sympathy in the great work of improving the dwelling houses of the laboring classes of our country.

"England and Wales have long been lagging behind France, Russia, Sweden, Germany, and Switzerland in the education of State control of midwives. The great importance of the reform in the practice of midwifery in our country has long been loudly accentuated by the consideration of the small number of trained and intelligent midwives at the present time compared with the host of unqualified and ignorant women who are unfortunately almost everywhere engaged by the humbler classes. It has been estimated by authorities that 60 or 70 per cent. of the births in Great Britain take place without the presence of a qualified practitioner, and that in many of the poorer districts as many as 70 or 90 per cent. of the births are attended by women. Surely these statements demand our earnest consideration, and I am bold enough to express a hope that more general interest will be developed in this great step in the right direction, especially when we consider that the dangers of childbirth are practically confined to the poorer class of our countrywomen, who, from lack of means, are unable to obtain skilled labor in the hour of need."

**Spread of Enteric Fever and Other Forms of Illness by Sewage-polluted Shellfish.**—Dr. Arthur Newsholme, of Brighton, said that in March, 1894, he reported to the Brighton Town Council a series of cases of enteric fever and diarrhea which appeared to be due to oysters obtained from polluted layings at Southwick, near Brighton. A copy of this report, with further details based on later experience, will be found in the forthcoming volume of evidence before the Royal Commission on Sewage Disposal.

The evidence on the strength of which enteric fever, attacks of diarrhea (resembling those caused by the Gaertner bacillus), and allied illnesses are ascribed to the ingestion of oysters and other mollusks requires consideration in connection with outbreaks of two kinds —(*a*) sporadic cases, (*b*) definite groups of cases. Of the latter the most remarkable are the outbreak among the students of the Wesleyan University, Connecticut, in which 25 per cent. of the students attending an oyster supper were subsequently attacked by enteric fever, and the simultaneous outbreaks following after mayoral banquets at Winchester and Southampton recently reported on by Dr. Bulstrode. In these two outbreaks, out of 266 total guests 21 (all of whom had eaten oysters), or about 8 per cent., suffered from enteric fever, while 118, or 44.3 per cent., of the total guests, all of whom except 3 had eaten oysters, suffered from minor forms of illness. In the two banquets 38 guests are stated not to have eaten oysters; none of these had enteric fever, hence the number of attacks among oyster eaters was 9.2 per cent. In Brighton the cases ascribed yearly to this cause (21 in 1894, 19 in 1895, 31 in 1896, 30 in 1897, 41 in 1898, 52 in 1899, 17 in 1900, 9 in 1901, and 21 in 1902) have in most instances occurred sporadically at irregular intervals and without any demonstrated relationship to other cases. In other words, on the assumption of causative relationship to the Southwick oysters which had been eaten by the patients, the infection must have been frequently present in a certain proportion of these oysters. In the paper already mentioned, he showed that this fitted in with the epidemiological facts of the case, no long interval elapsing between the occurrence of cases of enteric fever in the Southwick and Shoreham districts and in the inhabitants of Brighton who had eaten oysters or mussels contaminated by the Southwick or Shoreham sewage. It is obviously much more difficult to prove the relationship between cause and effect in connection with such sporadic cases than when definitely associated cases occur. The chief evidence on the strength of which he arrived at the conclusion that this fairly steady stream of sporadic cases was caused by sewage-polluted shellfish may be classed under four heads: (1) Clinical evidence; (2) exclusion of other known causes; (3) topographical evidence; (4) bacteriological and chemical evidence. These are placed in the order of importance. The three first are, he thinks, immensely more important and more trustworthy than the fourth, both on the negative and the positive side, though no line of evidence should be neglected.

**Clinical Evidence.**—The clinical evidence is usually as follows: About ten to sixteen days after eating oysters or mussels the patient fails with enteric fever. Very often the definite attack of fever has been preceded by a violent attack of diarrhea and vomiting occurring about twelve to twenty-four hours after the ingestion of the shellfish. Either (1) the person who

has partaken of the shellfish is the only one affected, or (2) other members of the family who have partaken of shellfish at the same time escape or suffer only from minor disorder. Numerous instances of both these are given in my annual reports. In the latter cases it is occasionally observed that the patient noticed something "queer" about his share of the oysters. Further, it is to be remembered that only a certain proportion of persons are susceptible to infection, that it is not reasonable to assume that every mollusk from a sewage-polluted source contains the typhoid bacillus, and that, even when an outbreak of enteric fever is caused by contaminated milk or water, only a small percentage of the persons drinking these are attacked.

The clinical evidence is supported by the ability to exclude other known causes. Cases of enteric fever due to contaminated water or milk nearly always occur in groups, while those due to oysters and other mollusks are, apart from certain exceptional outbreaks, generally sporadic. In a minority of the cases the possibility of the attack of enteric fever being caused by defective house drains had to be considered. On this point it was noteworthy that the attack generally occurred in the head of the household, who was least at home, his wife and children escaping. As more exact inquiries are made, it will now be generally agreed that defects of house drainage as a cause of enteric fever can be relegated more and more into obscurity. Given, on the one hand, bad drains, and on the other hand the fact that the only person suffering in a given house from enteric fever has partaken of oysters known to have been subject to pollution by sewage, we are bound to decide that in all probability the latter are responsible for the attack of enteric fever.

The topographical evidence is as follows. The oysters or other mollusks are traced to their original layings. In these layings, or more often in the market ponds in which they are finally placed before being sent to market, the oysters are found to be subjected to more or less gross contamination by sewage. The gravity of this contamination depends upon the proximity of the sewage outfall to the layings or the ponds, on the set of the tides, and on the size of the population whose sewage discharges at this point. Obviously the risk of the typhoid bacillus being conveyed to the oysters is much greater if they are subject to contamination by the drainage of several thousand persons than if only a small hamlet is concerned in the pollution. In his own experience, which has been concerned chiefly with oysters and mussels from Shoreham Harbor (Southwick, etc.) and with oysters from Emsworth, there has been no difficulty in stating that there has been sewage-contamination of the grossest character.

Bacteriological and chemical evidence has been placed last, as least important. It is not for him to assess the value attaching to the detection of the *Bacillus coli communis* in a given oyster. He is quite clear, however, that if this organism were not found he should brush the certificate to this effect aside as valueless in the face of clinical and topographical evidence that oysters from a given source were responsible for cases of enteric fever. If it were found its presence would be useful confirmatory evidence

**River and Seashore Pollution as it Affects Shellfish.**—Dr. T. C. Nash, Medical Officer of Health, Southend-on-Sea, said: "In my opinion it should be illegal to expose shellfish for sale unless they are from layings which are either entirely above suspicion, or at any rate are a very considerable distance from any obvious source of pollution, and in such a position as to be covered with seawater at all states of the tide, and unless a bacterial standard such as I have suggested elsewhere[1] is satisfied. I feel inclined to go even further, and say that, as with a public water supply, so also with all kinds of public food supplies, including shellfish—it ought to be an absolute condition that these should be uncontaminable by drainage. A proper control of shellfish will, I think, secure a notable reduction in the seasonal incidence of typhoid fever and a moderate reduction in that of diarrheal diseases generally.[2]

"There is bound to be some opposition in enforcing restrictions on the shellfish industry until the shellfish merchants recognize that it is in their own interests to take every possible care to obtain their shellfish from the purest possible layings. As a public health officer I consider it my duty to warn the public against eating shellfish from sewage-contaminated sources. In my own district the majority of the local shellfish merchants have realized the importance of taking every possible precaution. They now obtain their cockles from Whitstable from a spot well removed from any obvious pollution, instead of from the sewage-contaminated creek in a neighboring district as formerly. In addition they boil them for at least three minutes and a half in pure water. If all cockle vendors would take the same precautions, I venture to think that this variety of shellfish might be safely eaten, and that the cockle industry, if intelligently and carefully managed under proper sanitary supervision, may yet flourish and cease to be a serious danger to the public health.

"With respect to oysters, however, the conditions as to the cultivation, layings, and supervision must be most stringent and exacting, because this form of shellfish is generally eaten raw, and is, in my opinion, dangerous unless all the conditions are above any suspicion of sewage pollution.

"I have noticed that, generally speaking, the type of typhoid fever following the ingestion of par-boiled cockles is milder than that observed when raw shellfish are eaten. The inference is that the partial cooking of cockles has diminished the numbers or attenuated the virulence of the contained pathogenic bacteria of typhoid. On the other hand, Dr. Elliston of Ipswich has observed a severe type of typhoid fever following the ingestion of raw cockles collected from the Orwell. This would be in acordance with Dr. Klein's observation that typhoid bacilli actually multiply within the cockle even though the cockles may be put to clean for three days in clean seawater. The importance of these observations can not be overestimated, nor those of Professors Klein, Boyce, and Hewlett, that the oyster naturally does not contain the *Bacillus coli* or *Bacillus enteritidis sporogenes*, and that, therefore, the presence of these organisms is strong evidence of pollution of the shellfish by sewage or a sewage effluent.

"We must remember that different kinds of shellfish are eaten by different classes of people largely according to their means. This was happily put by Sir James Crichton-Browne, who spoke of 'the aristocratic oyster, the plebeian cockle, and the Hooligan mussel.'[3] We must also bear in mind that other forms of food besides water, milk, and shellfish occasionally carry the infective germ of typhoid. In my experience watercress is the next most likely agent, and this is not to be wondered at, considering that this pleasant vegetable is often obtained from streams which are liable to occasional pollution, if not constantly polluted. Other uncooked vegetables such as salads, lettuce, and radishes must also be borne in mind. Ice creams may occasionally be the vehicle. It is important to point out that whenever shellfish or uncooked vegetables are the vehicles of infection, the real source of infection is really, as usual, a polluted water, and therefore really only another form of water-borne typhoid.

"Uncooked vegetables are eaten in all parts of the

country, but it is a significant fact that typhoid fever is, as a rule, more prevalent in littoral coast towns (this is so at least in Essex), where shellfish are abundant; and in large centers of population inland which import considerable quantities of shellfish. Infected dust and fabrics, and flies,[4] no doubt all play some slight part in securing the admission of typhoid bacilli to articles of food, or directly to the mouth; but in my opinion these sources of infection are comparatively rare in this country. But infected fabrics and infected flies certainly account for a considerable proportion of secondary cases where the primary cases have followed the use of infected water, milk, or shellfish.

"Schemes for the purification of sewage may prove disastrous as regards the pollution of shellfish. The creek to which I have alluded more than once is a case in point. Though this creek has for years past been subjected to some pollution by the discharge of crude sewage, it latterly has received the sewage of the whole town, which numbers about 4,000 residents, besides a considerable number of visitors in the summer. The sewage is treated bacterially in contact beds, and the effluent is discharged into the creek a few hundred yards above the cockle layings. Though a considerable degree of chemical purification may be thus achieved we know that bacterially the effluent is practically as impure as the crude sewage, and that we can not expect contact beds to keep back typhoid bacilli. Hence this method of sewage treatment has rendered this creek even more dangerous than formerly, for whereas formerly, it was necessary for one of only a very few houses to harbor a case of typhoid fever in order for the specific germ to enter the waters of the creek, nowadays it is only necessary for a case of typhoid fever to occur anywhere in the town, even a mile away, to run the almost certain risk of pollution by the specific microbe. Hence these cockle layings are obviously much more dangerous since the bacterial beds installation than formerly. This is an important point to bear in mind when advising a sanitary authority as to the treatment of sewage for a town which has a shellfish industry."

REFERENCES.

1. Evidence before the Royal Commission on Sewage Disposal.
2. See Trans. Epid. Soc., 1903. "The Seasonal Incidence of Typhoid Fever and Diarrhea," by J. T. C. Nash, M.D.
3. Presidential Address to the Sanitary Inspectors' Association, January, 1903.
4. Firth and Horrocks, British Medical Journal, 1902, II, p. 936.

(To be Continued.)

## BOOK REVIEWS.

The American Year-Book of Medicine and Surgery, 1903. Under the General Editorial Charge of Geo. M. Gould, M.D. W. B. Saunders & Co., Philadelphia, New York, London.

If we attempt to compare any one, or all, of the numerous year-books with this volume, a novice would at once comment on the impossibility of the task. In typography, in bookbinding, in the detail of its general management, in the importatnce given to the most critical points of surgical progress—in short in every respect, this year-book is fully equal to its predecessors. No student or practitioner who wishes to keep abreast of the times can possibly dispense with it.

A full and interesting account is given of the classic case of President McKinley. Particular attention is shown the new methods of massive infiltration anesthesia as perfected by Matas, and that new and important department of surgery which deals with the mitigation of deformities by the subcutaneous introduction of paraffin has received most careful attention.

Of particular interest in the Section on Obstetrics is the detailed article touching on the xiphopagus twins Radica and Doodica. Gynecology received its full share of space and an unusual amount of illustrating is accorded it. Not unimportant are the full details of an improved angiotribe with an illustration of its application to hysterectomy. Orthopedic surgery receives apt attention, a simple and practical wrench for the correction of stubborn deformities being among the important devices shown. The eye, ear, throat and nose are given generous space and should be looked over by everybody interested in those departments of surgery. Last but not least, is a chapter on anatomy which relates the findings both microscopical and macroscopical of the last year.

The Protozoa and Disease. By J. Jackson Clarke, M.D., London. William Wood & Co., New York.

This small work of 177 pages is an excellent straightforward account of the many forms of protozoa that are known to infect man and the lower animals. The book is to be preferred to many similar works of the kind in that, instead of presenting a discrete, unorganized series of facts concerning this important branch of parasitology, it deals with the subject: (1) from the strictly zoological point of view and (2) from the standpoint of the systematic student. Thus, whereas one might consider at first sight a preponderance of zoological information in the work to the detriment of its pathological relationships, it must clearly be seen that if one is to get a thorough knowledge of this steadily widening branch of medicine it will be necessary to get at the fundamental anatomical features of this class of organisms. The work's conciseness as well as its logical arrangement commends it.

The Roentgen Rays in Medicine and Surgery as an Aid in Diagnosis and as a Therapeutic Agent. Designed for the Use of Practitioners and Students. By Francis H. Williams, M.D. Third Edition. The Macmillan Co., New York.

We have had occasion to commend this work in unmeasured terms. It has been up to within the last year the only work of its kind and remains the leading book dealing with the general use of the X-ray in medicine and surgery. The third edition the author considers a report of progress rather than a final presentation and the book has been largely rewritten and special chapters on the X-rays as a therapeutic agent added. Treatment of diseases of the skin and new growths is further presented and there is finally added a bibliography of recent work with the X-ray.

Any one who does anything whatever with the X-rays will find this work invaluable and for those who have never utilized this important aid in diagnosis and therapeutics they neglect their opportunities in not having a work of this kind.

A Treatise on the Care of the Expectant Mother, During Pregnancy and Childbirth and Care of the Child from Birth until Puberty. By W. Louis Howe, M.D. F. A. Davis Co., Philadelphia.

This is all told in 64 duodecimal pages. The book consists of short paragraphs that would be very useful to the young mother. There is very little that is new in the book, as would naturally be supposed, the author disclaiming any originality, his object being to put the expectant mother on a common-sense footing as to her condition, the care of herself during the period of pregnancy and the care of the child after birth. As to the care of the child after puberty the instruction is very inadequate.

The Care of the Baby. A Manual for Mothers and Nurses. By J. P. Crozier Griffith, M.D. Third Edition. W. B. Saunders & Co., Philadelphia, New York and London.

There have been many books published within the last two years on the care of the baby. Dr. Griffith's has the distinction of having been one of the very first in this field and in its present third edition it reflects ripened judgment not only from the standpoint of the pediatrist but from that of the book writer.

Very little need be added to our previous reviews of this work. The present edition differs from the previous ones in that it has been thoroughly revised, carefully rewritten and a large number of illustrations have been added. It is, we believe, one of the very best of the popular works that can be recommended by the profession to the laity.

Materia Medica and Therapeutics. By A. A. Stevens, A.M., M.D. Third Edition. W. B. Saunders & Co., Philadelphia, New York and London.

This text-book of Dr. Stevens was a very popular one on its first appearance. It has now been thoroughly revised, reset, and brought to date so that at the present time it represents a very handy and convenient text-book on materia medica and applied therapeutics.

It is not expected to be a monograph on physiological action, but represents a carefully condensed account of what is sound in our knowledge of this branch. It can be cordially recommended to the beginner in materia medica.

A Thesaurus of Medical Words and Phrases. By Wilfred M. Barton, M.D., and Walter A. Wells, M.D. W. B. Saunders & Co., Philadelphia, New York and London.

It was a happy idea, this, of the author's, to give us a medical thesaurus. It is the only one published and for every doctor who does any writing at all or reading, who desires to hunt out synonyms and antonyms the work will be invaluable.

It is not an encyclopedia nor a dictionary, but is a convenient handy volume for reference along the lines indicated.

We wish for it a very cordial reception.

Uric Acid as a Factor in the Causation of Disease. By Alexander Haig, M.A., M.D., F.R.C.P. Sixth edition. P. Blakiston's Son & Co, Philadelphia.

It is a very pleasant thing indeed to ride a hobby and the mental strabismus that results from a ten years' uninterrupted round the ring performance is well shown in this bulky book of Dr. Haig's.

We believe that it will not be many years before the uric acid hypothesis will be laid on the shelf and Dr. Haig's work be considered another monument to the ignorance of the times. In saying this, however, it should not be forgotten that the uric acid hypothesis of which Dr. Haig has been the most consistent originator, supporter and augmenter, has played a very definite and useful rôle in the study of disease processes. We have not the slightest doubt that the zealot's zeal of the author and his followers focused the attention of all practitioners on the desirability of a careful study of perverted metabolism and laid the foundation of much useful knowledge.

It is sometimes necessary for a false prophet to arise in order that great truths may be learned. Dr. Haig's uric acid hypothesis has served its day. If in the seventh edition Dr. Haig should cut his work down to 200 pages and tell us really what is worth knowing about the relationships of disease to disturbed proteid metabolism, taking the occasion to consider the work of physiological chemists who work in laboratories as well as in clinics, he would confer a great favor on the profession, but we fear that he has ridden his hobby so long that he is incapable of distinguishing between fact and error.

Turning to the book in critical manner, we can not feel but almost every page contains some misstatement. The chapter on uric acid and the circulation being a perfect jumble of disconnected erroneous statements or half truths that a really scientific man should be ashamed to put forth in this day as facts.

The Exact Science of Health Based upon Life's Great Law. By Robert Walter, M.D. Vol. I. Principles. Edgar S. Werner Publishing Co., New York.

This is an interesting work of 302 pages, dealing with a side of science that the doctor rarely considers. In fact he is so busy with the ordinary routine of his day's labor that he does not have time to discuss, much less read about, some of the philosophical principles related to the phenomena of the nature of disease and the processes of cure.

Life's great law, as defined by the author, recognizes that "every particle of living matter in the organized body is endowed with an instinct of self-preservation, sustained by a force inherent in the organism, usually called vital force, the success of whose work is directly proportioned to the amount of force and inversely as the degree of its activity."

The author then goes on to discuss the "constitution of nature," "heat and light," electricity and magnetism being considered as incident forces.

Transmutation Fallacies, Vital Science in its Relation to Philosophy; Life, its Nature and Source, Life's Secondary Laws, Social and Scientific Paradoxes; Health and Disease; Good Health and How to Regain it; The Vital Reservoir and How to Fill It; Vital Development and How to Secure it, are all chapters in this interesting résumé.

As this volume is but the first of a series, the author has not completely elaborated his argument, and we must wait for a second volume to pass judgment.

Disease of the Pancreas, Its Cause and Nature. By Eugene L. Opie, M.D., Associate in Pathology in Johns Hopkins University; Fellow of the Rockefeller Institute of Medical Research. J. B. Lippincott Co., Philadelphia and London.

The pancreas has remained one of the last of the organs of the body to yield up its secrets. Owing to a number of special conditions connected with its shape, size, location, its color and consistency, and its rapid disintegration, there is no organ of the body the pathological changes in which are more difficult to recognize and when recognized more difficult of interpretation.

The structure and functions of the gland are very little known and it is especially appropriate that a work of this kind should be presented, summing up our knowledge of the diseases associated with changes in the pancreas.

No one in this country can speak with more authority than Dr. Opie and we congratulate him on the excellent work here presented. We commend it most heartily to the attention of the profession and trust that with this introduction our lack of knowledge of pancreatic diseases may no longer remain an opprobrium in medicine.

# THE MEDICAL NEWS.

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## ORIGINAL ARTICLES.

### EXTIRPATION OF THE URINARY BLADDER.

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THIS has been necessitated by (1) malignant growths, involving the organ primarily or secondarily; (2) tuberculosis; (3) exstrophy; (4) uretero-vaginal fistulæ following extirpation of the uterus (a few instances) (Harnleiter-Scheiden fistulæ, *Schweitzer Correspondenz*, No. 4, 1901); (5) fibroids of the uterus (one instance) (*Am. Gyn. & Obstet. Journal*, Morten XVI, 1900).

Malignant tumors which have required complete removal of the bladder have numbered, so far as I am aware, 23. Eleven cases were performed with intestinal implantation of the ureters (Maydl). There were six deaths, as follows: two from shock, one from pyelo-nephritis on the sixteenth day—failure of implantation, one from uremia on the fifth day, one from failure of implantation and death from sepsis and uremia—fourteenth day, one from pyelo-nephritis antedating the operation.

Seven operations were performed with vaginal implantation of the ureters. There were two deaths, one from collapse twenty hours after operation; the other from septic peritonitis on the ninth day. Two operations were performed with urethral implantation of the ureters. There were two deaths, one from shock, the other from uremia. Two operations were performed with skin implantations of the ureters (abdominal wall). There was one death from shock. One operation was performed with one intestinal and one skin implantation of the ureter from which the patient recovered (Dr. G. Woolsey).

The recoveries were 12 out of 23 cases, or 52.17 per cent. One patient lived eight years and nine months; one lived three and a half months and died from an unknown cause; one lived four months and died from pyelonephritis; one lived seven months; one three years and six months; one three years, and one lived two years. These last four were lost sight of. Five patients died during the operation, but no subsequent account is given of them.

The deaths were 11 out of 23 cases, or 47.83 per cent. Among the causes of death, uremia figures twice; shock, five times; failure of union of ureters with the intestine, sepsis and uremia, twice; pyelonephritis antedating operations, once; septic peritonitis, once. In comparing these cases with those in which a part of the bladder has been removed and one or both ureters so involved as to require their implantation into other portions of the reconstructed bladder I can find 12 cases of the latter condition with 7 deaths, or 58.33 per cent., and 5 recoveries, or 41.67 per cent. Of the 5 recoveries, 3 had recurrences in 3, 5 and in 14 months. In one case the patient was free from recurrence at three months from the time of the operation. In the remaining case, death occurred two months after operation from croupous pneumonia (*Archiv für klin. Chir.*, XXII).

Of the 7 deaths, 3 died of collapse following operation and 4 died a few days after operation. In 3 of the latter, the ureters were dilated and the patients died of collapse and syncope. In the fourth case death was due to sepsis following phlegmon of the pelvic connective tissue. Hence, when the ureters are implanted elsewhere than into the bladder and the bladder is removed, the recoveries are 52 per cent., and when the ureters are implanted into the reconstructed bladder the recoveries are 41.67 per cent. This difference in favor of the complete cystectomy seems due to two causes: (1) Vaginal implantations of the ureters where the recoveries have been the greatest in number. (2) The non-involvement of the ureters by the malignant process and the absence of secondary inflammatory process in the ureters.

The very best results as to the freedom from recurrence are seen in the cases where the bladder is involved secondarily to an adjacent organ (uterus) and the ureters have been implanted into the vagina. In these cases the recoveries have been 71.5 per cent., the mortality 28.5 per cent.

The total extirpation of the bladder with the implantation of the ureters elsewhere than in the vagina gives 43.75 per cent. of recoveries and 56.25 per cent. mortality. These results are quite as good as the partial extirpation of the bladder with implantation into the reconstructed viscus, viz.: Recoveries 41.67 per cent.; mortality 58.33 per cent. The so-called cures in complete extirpation make a better showing than in the partial operation; whereas in the former several cases are reported as free from recurrence at four, seven and ten months, two years and eight and three-quarter years, in the latter of 5 cases recovering from the operation recurrences took place at three, five and fourteen months, respectively, in 3 cases. In one case death took place from pneumonia at two months. One case was free from from recurrence at four months.

It follows, then, that if the ureters and the bladder are involved, the complete extirpation of both and the implantation of the ureters into the vagina gives the best results both as to recovery and freedom from recurrence. This method, however, gives the patient no control over the urine and requires the constant use of the cathe-

ter under the best conditions. If the patient be a male, I believe complete extirpation of the bladder is the proper procedure; but whether we should implant the ureters into the urethra or the skin and wear a urinal, or should implant them into the intestine with rectal continence is still a question not settled.

So far as cases go, the results of intestinal implantation give 6 deaths in 11 cases—54 per cent. mortality—in which 2 died of shock, 1 of uremia on fifth day, 1 of failure of anastomosis and sepsis, 2 of pyelonephritis antedating operation. The results of the urethral and the cutaneous implantations give 3 deaths in 5 cases—60 per cent. mortality—in which 2 died of shock and 1 of uremia.

The choice for the method of dealing with the ureters in the male offers but little advantage one over the other. What is offered seems to be in favor of the urethral or cutaneous implantations, since the deaths were due in large measure to avoidable causes.

The second cause for extirpation of the bladder has been tuberculosis of that organ. Tuberculous ulcers of the bladder have been greatly benefited and some have been cured by suprapubic drainage. Such cases have been reported by Curtis (*Annales of Surgery*, 1895), Powers (*Annals of Surgery*, 1902) and Cheyne (*Lancet*, June and Oct., 1895). By hygiene and climatic treatment other ulcerations have been reported as healed by Bolton Bangs (*Annals of Surgery*, Oct., 1895), and by Gordon (*Dublin Journal*, May, 1899). In other cases of ulcerations of this variety excision or destruction of the ulcer has proved successful (Strauss, *Wiener medicinische Wochenschrift*, No. 51). In another class of cases in which the process is extensive, extirpation of the bladder has been resorted to, as a cure, by Martin (*Amer. Gyn. and Obstet. Jour.*, 1900, xvi, pp. 395-429); by Carl Beck (*Annals of Surgery*, 1899, p. 186), and by Trendelenburg (*Verh. den D. G. für Chir.*, 1895). In one case, the mucous membrane of the bladder, together with the ulcers has been removed and has been reported as curative (Delagénière, *Bulletin et Mem. de la Societé de Chir.*, 1895, p. 251).

All of these methods have had their successes. In no one method can the importance of hygienic and climatic treatment be neglected. The case I wish to report is one which required more than local treatment and rest by drainage. It was one which in my judgment could not be cured without a cystectomy. This history is as follows: Mary T., admitted to New York Hospital on April 19, 1902. Discharged June 9, 1902: clerk, U. S.; age, eighteen years. Previous history revealed no personal history of tuberculosis, but two uncles died of consumption. She had measles when a child, and one year ago had pleurisy and pneumonia. No venereal history. Present illness began three years ago when frequent micturition and burning pain in the bladder occurred. Three years ago a vesicovaginal fistula was made. This gave some relief, but was very annoying. Two years ago she had this fistula closed but the old symptoms, frequent micturition and burning pain gradually returned so that within six months her condition was unbearable. One year ago a suprapubic cystotomy was performed, and with this drainage and local treatment she was again relieved in part, but not entirely. After six months of drainage she again submitted to an operation, closing the suprapubic wound. As soon as this was closed her former frequent micturition returned. She has at present constant burning pain, frequent micturition and at times slightly bloody urine. There is constant pain and increased sensitiveness over the external genitals and the bladder. The external genitals are not observably congested. There are two bed-sores upon the buttocks from the constant contact with the urine. Her general condition seems good.

The physical examination of the thorax and abdomen is negative. The examination per rectum reveals nothing but an excessively sensitive bladder. A cystoscopic examination reveals a chronic cystitis and ulcerations upon the base and posterior wall of the bladder. The urinalysis shows the urine to be cloudy, alkaline, yellow, 1.018, albuminous; no sugar, mucus, leucocytes or tubercle bacilli. Diagnosis was then made of tuberculous ulceration in the bladder. Since the ulcerations involved the base and posterior wall of the bladder and were not seen at the urethral orifices this tuberculous process was probably of vesical origin (at least not renal). An exploratory operation was agreed upon for the purpose of excising the ulcers, or dissecting away the mucous membrane, or, as a last resort, the extirpation of the bladder. The patient readily agreed to this suggestion.

The operation was performed April 28, 1902. A vertical incision, four inches in length, was made, extending from the lima alba to the peritoneum. The cavity of Retzius was entered and the peritoneum was raised from the abdominal wall and from the fundus of the bladder. A generous incision was then made through the fundus of the bladder and its interior inspected. The base and greater portion of the posterior wall was seen to be covered with small ulcerations, extending into and through the mucous membrane. Some areas were devoid of mucous membrane and the bases of the ulcerations were covered with dirty-grayish sloughs. Beneath the bladder, at the base near the left ureters two or three small glands were felt through the bladder wall. Beneath the ulcerations, upon the posterior wall of the bladder, the tissues are much thickened and did not glide upon one another. The mucous membrane about the urethral orifices seemed swollen but healthy and unbroken. It did not seem possible to remove the ulcerations without perforating the bladder wall, nor did it seem possible to excise the base of the bladder and leave the ureters. The only possible outcome appeared to be to anastomose the ureters with the rectum or vagina after the complete removal of the blad-

der. As the ureteral orifices seemed healthy, and the disease could not be thoroughly removed without sacrificing over two-thirds of the bladder, and that at the base and posterior surfaces. I decided to remove all of the bladder except that immediately surrounding the ureteral orifices (a circle of three-fourths of an inch in diameter). This being the case I could unite the bladder wall and mucous membrane surrounding the ureters to one another and then implant them by the Maydl method, or I could implant them separately by Pozzi's method. I preferred the intestinal to the vaginal implantation, because of the favorable results following this method in extrophy of the bladder, both as concerns the infection of the kidney and the tolerance of the urine by the rectum. Sufficiently prolonged and careful treatment had been carried out in this city in three of our hospitals and under the best observers, so that no hesitancy was felt in the necessity of this step.

Acting upon this decision, the peritoneum was carefully stripped from the fundus and the posterior surface of the bladder until the ureters were recognized and the base was exposed to view. This was accomplished with surprisingly little hemorrhage. Each ureter was now divested of its connective tissue attachments in the broad ligaments, care being taken not to interfere with its nutrition by stripping the ureters too closely. When they were dissected so as to move freely, the bladder was removed, leaving each ureter surrounded by an irregularly shaped piece of bladder wall three-fourths by one-half inch. These two pieces of bladder wall were trimmed and sutured together preparatory to suturing them into the sigmoid flexure (Maydl's method). The peritoneum was now opened by a vertical incision, passing from the fundus of uterus upward two inches. The sigmoid flexure was drawn through it sufficiently to allow its being clamped above and below the point of implantation.

A vertical incision was now made in the intestine and the ureters with their surrounding (1 cm.) of bladder wall were implanted. The mucous membrane of the bladder and that of the intestine was sutured by interrupted silk sutures. The serosa of the intestines was sutured to the connective tissues and muscular coat of the bladder by another row of silk sutures. This union of the sigmoid and ureters would undoubtedly be pressed upon by any enlargement of the uterus and to avoid such pressure a transverse incision was made upon each side at the lower angle of the vertical one in the peritoneum and through these slits which passed through the peritoneum of the broad ligament the ureters were displaced backward and outward allowing the uterus to appear between them. This was accomplished without difficulty. The vertical and lateral peritoneal incisions were now closed. At this time the glands, which were felt to be near the left ureter when examining the interior of the bladder with the finger, and which we carefully avoided when loosening the left ureter in the broad ligament were extirpated. The abdominal wall was sutured and a small strip of rubber drainage placed in the cavity of Retzius. The wound was dressed aseptically. A No. 30 catheter was inserted into the rectum.

April 19. Temperature, 99° F.; respiration, 24; pulse, 100. April 20. Slept half of the night. April 21. Pain in the rectum; urinalysis, yellow, cloudy, alkaline, 1.018; albumin; no sugar; mucus; leucocytes. April 28. Patient complained of much pain in the wound. Little urine has been caught by the tube. She is restless, with a pulse of 136, and a temperature of 97° F. The drainage in the cavity of Retzius was removed and as nothing was seen, a posterior vaginal section was made. No leakage had taken place either into the peritoneal cavity or into properitoneal space. Urinalysis, smoky, yellow, turbid, alkaline 1.008; albumin, a trace.

May 1. Rectal tube removed. Urine passes involuntarily, caught in napkin; rectum irrigated regularly, three times per day. May 2. Patient sleeps well; holds urine about two hours; rectal irrigation of six hours. May 6. Sutures removed. May 10. Same treatment. Urinalysis, yellow, cloudy, alkaline, 1.010; albumin, a trace; no sugar, mucus; detritus microscopically negative.

May 15. Retained 18 oz. urine
1 oz. urine
18 oz. urine
} Three passages during the day.

May 17. Retained 16 oz. urine
1 oz. urine
16 oz. urine
} Three passages during the day.

May 19. Retained 18 oz.urine
13 oz. urine
} Two passages during the day.

May 30. Urine is made three times daily and once or twice at night.

June 6. Discharged cured.

*Specimen.*—Represented by a piece 9x4 cm.; deeper layers of the bladder wall apparently normal. Mucous membrane shows many ulcerated areas, with a marked chronic cystitis. The glands removed show tuberculous involvement. Diagnosis, chronic cystitis; tuberculous ulceration.

January, 1903.—This patient presented herself at the New York Hospital, Jan. 10. She is in good health, is employed all day as a clerk. Makes water three to four times during day and once or twice at night. Urine collected from the rectum shows it to be alkaline, cloudy; 1.010; a trace of albumin; no sugar; mucus; detritus. Microscopical examination is negative.

The third condition demanding at times a removal of the bladder is exstrophy of the bladder. My views upon this subject have been fully enunciated in the *Annals of Surgery*, July, 1901. At that time, among other cases, I related the history of a patient three years of age, operated upon on Feb. 22, 1900, for this malformation, in whom the bladder was removed and the ureters

implanted in the upper portion of the rectum. On March 27, 1901, the patient was in good health, with no renal, or rectal irritation or tenderness. The urine was passed every four hours. At night once unless the child neglected it before going to bed. On June 30, 1901, this patient died in a hospital in Philadelphia. The cause of death is stated to be "enteritis." I have not been able to obtain more knowledge of the case.

At the same time I gave the history of another patient operated upon by me in 1894 at the Roosevelt Hospital by the method of superimposed skin flaps, and again in 1899, at the New York Hospital. The second operation for closure of the urethra by Küster method failed. In consequence of this failure the patient was advised to return to the hospital within six months for a radical operation consisting in either the removal of the bladder with implantation of the ureters by the Maydl or Pozzi method or by rectovesical anastomosis of Frank. For this radical procedure he entered the New York Hospital Nov. 5, 1902. Patient is now eighteen years of age.

Operation occurred Nov. 6, 1902. A median incision in the abdominal wall was made which exposed the peritoneum above the bladder. Enucleation of the bladder which was difficult on account of the vascularity and the old scar tissue formed seven years ago. The bladder was removed, except a piece of the trigone 1½ by ½ inch, including the orifices of the ureters. The peritoneum was now incised and the suture of the sigmoid and the bladder wall containing the ureters was made with two rows of silk sutures, as in the previous case.

Abdominal wall sutured; prevesical space drained with gauze; rectal tube inserted; urine collected during day, 44 ounces. Nov. 7, dressed, 32 ounces. Nov. 8, patient complained of epigastric and lumbar pain on right side. Bowel irrigated. Urotropine grs. x q. i. d. Urinalysis brown, 1.012, alkaline, considerable albumin; phosphatic crystals; mucus, 53 ounces; Nov. 9, urine, 36 ounces; Nov. 12, 26 ounces; Nov. 13, 48 ounces; Nov. 14, 37 ounces; Nov. 15, 35 ounces; Nov. 16, 64 ounces; Nov. 26, discharged, cured.

For exstrophy of the bladder, the extirpation of the viscus with the implantation of the ureters into the sigmoid flexure or the rectum has been performed 46 times with a mortality of 15 per cent., 6.5 per cent. of this represents infection of the ureters and kidneys occurring immediately after or at a remote period from the operation. In how many cases the infection of the ureters and kidney has antedated the operation cannot well be obtained owing to the failure of the proper urinary examinations. 8.5 per cent. represents shock, a condition which may be avoided by improved technic and a better selection of cases.

Of these 46 cases, 1 case was seen four months after operation; 15 cases were seen one year after operation; 13 cases were seen two years after operation; 9 cases were seen three years after operation; 1 case was seen seven years after operation.

The best methods of treating this condition, provided the construction of a continent bladder is impossible, seem to be (1) cystectomy with the intestinal anastomosis of Maydl or Pozzi. (2) Vesicorectal anastomosis (Frank). (3) Extirpation of the bladder and urethral implantation of the ureters (Sonnenberg). (4) Extirpation of the bladder and vaginal implantation of the ureters (Pawlik).

The remaining conditions for which extirpation of the bladder has been performed are rare and have not come under my observation. Were such cases presented it is to be observed that the intestinal anastomosis presupposes intact ureters and gives rectal continence, whereas the vaginal implantation gives slightly better results, but without urinary continence and requires the use of a urinal.

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## THE PROGNOSIS OF TABES: AN ANALYSIS OF 140 CASES OF LOCOMOTOR ATAXIA.*

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When discussing the symptomatology of tabes I called attention to the variability of its clinical manifestations. The course of the disease in different individuals is one of the most remarkable things about it. One patient will have it for ten years and be made aware of it only by lancinating pains, impaired sexual vigor and occasional nocturnal incontinence of urine. Another develops hypotonia and ataxia so rapidly that he becomes bedridden a few months after the onset of subjective symptoms. The symptoms of tabes are customarily said to display themselves in three stages which constitute the course of the disease: (1) The preataxic stage; (2) the ataxic stage; (3) the profoundly incoordinate and hypotonic stage, often spoken of as the paralytic stage, but in reality there is no actual paralysis save exceptionally and then it is to be considered a complication.

The duration of these three stages or periods can only be approximated, it varies so enormously in different patients. We have no means of estimating how long the disease, as evidenced by unequivocal signs, has been in existence when the patient comes under observation. For instance, in the following case the disease may have been present for many years. A woman, thirty-eight years old, who married at twenty-one years of age, but who had never borne children said that for four years before coming to see me she had rheumatism from the toes to the waist line. It was never very severe but sometimes for a few days at a time it would require medicine from her

* Part I of this series was published in the Medical News, Jan. 3, 1903; Part II March 7 and 14, 1903; Part III June 13 and 20, 1903.

physician. The symptom for which she consulted me was a "sore, sensitive sensation" in the left leg and a numbness of the legs which was gradually crawling up to the thighs. Examination showed Argyll-Robertson pupils, loss of knee and ankle-jerks, hypotonia, hypesthesia and hypalgesia of the legs, especially of the outer surfaces. There was no complaint of incontinence of urine, girdle sensation, paresthesia, disturbance of gait or station, or diplopia. The diagnosis of tabes in such a case can be made with as much positiveness as if ataxia were one of the symptoms.

Babinski (*Revue Neurologique*, Jan. 15, 1902, p. 59) has related the case of a woman, sixty-five years old, who consulted him for some trivial affection and who presented inequality of the pupils, Argyll-Robertson phenomenon, and absence of the Achilles-jerks, objective symptoms which led him to make the diagnosis of tabes. On inquiry he satisfied himself that some of these symptoms had dated from the patient's twentieth year. In other words, the disease had existed in a benign way for forty years.

To date the beginning of the disease from the onset of symptoms noted by the patient would often give us very unreliable information on this point. I have the histories of a number of patients in which the diagnosis of tabes is certain, although there are no symptoms which the patients consider to be those of tabes. For instance, a man, fifty-five years old, came to see me on October 22, 1902, and said that the morning before on arising he found that he could not open the right eye and when the lid was lifted with the finger that he saw double. Examination showed ptosis and paralysis of all the eye muscles save the superior oblique and external rectus, the pupil being widely dilated and unresponsive to light. Examination showed in addition to this exaggeration of the knee-jerks, normal ankle-jerks and tachycardia. December 28, 1902, all traces of the ptosis and ocular paralysis had entirely disappeared. In the meantime he had been having bichloride of mercury hypodermically, one-third of a grain every second day and iodide of potash, 90 grains a day. June 1, 1903, examination revealed Argyll-Robertson pupils; distinct Rombergism; sluggish ankle-jerks; left knee-jerk exaggerated, right diminished; distinct hypesthesia over both peroneal surfaces; incontinence of urine nocturnal and diurnal. Such association of symptoms leaves no doubt as to the diagnosis of the disease.

In contrast to these cases, I may refer to the following case to illustrate the rapidity with which the disease occasionally overwhelms the patient. Mrs. B., married, has borne three children and one miscarriage. There is no history or indication of syphilitic infection. She maintains that she was well and had been so on September, 1902, when she stepped on a banana skin and fell to the sidewalk striking the right leg. Apparently she was not injured for she got up and went along. That night the leg felt sore, but after having it rubbed with alcohol it felt better. The next day she went to work but felt nervous and "shaky." The following day she was so nervous and had so much pain in the leg that she had to leave off work. The pain which was in both legs, but more in the leg that was injured when she fell than in the other, increased for a few days and then went away. She then noticed that she could not walk steadily and this grew gradually worse until at Christmas time, *i.e.*, three months later she was so unsteady in her gait and uncertain in her step that she could not go out unattended. When I first saw her, six months after the onset of the symptoms, she had no complaint of any sort to make save of difficulty in standing and walking. The ataxia which she presented, both of station and locomotion, was very profound and she could walk only when aided by another person and could stand only when holding something. On attempting to go downstairs and frequently when walking through the room there was sudden giving way of the knees. The knee-, ankle- and elbow-jerks were absent, the plantar-jerk was present, not lively, and of the flexor type. The pupils were equal, of moderate size and unresponsive to light but quickly responsive to accommodation. There was no anesthesia or analgesia of any part of the body. She says that the prick of a pin is felt more distinctly over the upper part of the thorax than over the middle and lower, but in reality there was very little difference. There was no girdle sensation, diplopia, incontinence of urine, hypotonia or trophic manifestations. In other words, the case is distinctively an example of the motor type of tabes which I have already described (See Case 7, Medical News, March 14, 1903).

The length of time that elapsed between the first symptom of the disease and the appearance of ataxia in my 140 cases, was three years and five months. These figures may be very misleading. In the first place patients seen in the hospital for the first time a number of years after the beginning of the disease have very little idea when the disease really began or what period intervened between the first symptom of tabes and the ataxia. Then again a few cases like that last related in which ataxia is an early symptom makes the average duration of the preataxia stage appear much shorter than it usually is. I am inclined to believe that the preataxia stage of tabes in all cases save those of the motor type is oftener above five years than below.

The average duration of the disease is difficult for me to estimate as I have been in the way of seeing many cases of the disease only during the past ten years. Of the 140 cases that I am here analyzing, 11 have died and the average duration of the disease in these cases was thirteen years. This does not actually show the duration, for four of these cases died of intercurrent diseases. One from acute Bright's disease, two from tuberculosis, one from probable rupture of an aneurism and one from suppurative peritonitis from rupture of an abscess.

The matter that interests us as physicians, and

our patients with locomotor ataxia, is, What can we tell them from a consideration of the symptoms and signs of their disease about their future. Can the wage-earner be assured that he will be able to provide for his own needs and those of his family for a certain length of time and if so, how long will it probably be. Shall the man of affairs be counseled to continue the direction of his business or shall he, when he learns that he is suffering from an incurable disease, relinquish his work and prepare for translation? In brief, what are we able to tell a person after we have diagnosticated tabes of what the future has in store for him. He is no longer interested in the etiology of the disease and even though he might be, what we have to tell him on that score only adds to his misery.

The factors that influence the prognosis are: (1) The clinical type of the disease; (2) what may be called the anatomical type of the disease, *i.e.*, whether of the lumbar or lumbo-dorsal cord (the customary location) or of the cervical or cervico-bulbar region; (3) sex and age; (4) the individual, his occupation and the treatment.

Next to these cases the prognosis is most favorable in the cases that I have referred to as the motor type and this is especially true since the introduction of the Fraenkel system of exercises and the more general utilization of orthopedic apparatus. The outlook in this class of cases is best when symptoms of involvement of the sympathetic nervous system are not profound. On the other hand, it is unfavorable when severe disturbance of the urogenital system and trophic symptoms are early and conspicuous manifestations. It is in cases of this sort that certain health resorts or certain therapeutic measures get a reputation for "curing" tabes which is wholly undeserved. I have notes of a patient of this sort who is convinced that the treatment of Lamalou is responsible for the very considerable recovery which he has made. It does not alter his opinion of the efficacy of the treatment of Lamalou for tabetics to know that I have notes of a dozen patients who have not been particularly benefited by repeated visits to this favorite French resort. I have seen patients having this same type of the disease benefited from the combined effect of wearing a pair of shoes for which he paid $3,000 and the emotional exaltation which he got from coming in contact with an individual who had the assurance to ask that amount for them, and I have seen them get entirely well functionally under a treatment of rest and graduated exercises. As an example of this I may refer to the history of a young lady quoted in the article on Symptomatology. When she first came under treatment she was able to walk only when steadied and supported on either side, but within two years she had returned to her work on the stage, which necessitated dancing. She is now apparently quite well, the only symptoms being incontinence of urine and loss of sexual desire. The signs of tabes are still unequivocal.

The clinical type of tabes which in my experience has the least favorable prognosis is that in which disturbance of the sympathetic nervous system predominates; vesical symptoms, crises, trophic manifestations in the soft and hard tissues. Cases in which the bladder and rectum are involved early and severely, often pursue a rapid course little influenced by treatment. Moreover incompetency of the bladder often opens the road to complications such as cystitis and pyelitis and their consequences which not only add to the patient's suffering and depreciate his vitality, but may directly or indirectly cause death. Although death rarely occurs during tabetic crises of one kind or another, they gloomify the prognosis through the exhaustion which they produce and by reason of the fact that patients who suffer from them are liable to become victims of morphine. I have pointed out in another article ("Tabes and Progressive Muscular Atrophy," *Journal of Nervous and Mental Disease*, June, 1903) that tabes when associated with profound atrophy of the muscles of either neural or spinal origin is apt to be atypical in its clinical delineation and to run rather a rapid course. I have not noted that the occurrence of the milder forms of atrophy influences the prognosis. They may do so by incapacitating the patient from getting about and by impairing the vital resistance of his tissue to infections such as tuberculosis, pneumonia and erysipelas. The same statement holds true, I think, for the arthropathies.

In 1881, Benedikt, of Vienna, in writing of the prognosis of tabes, made the statement that the clinical form of the disease in which the prognosis was far more favorable than in any other was tabes with atrophy of the optic nerve. A few years later he maintained that it was a rule without exception that the motor symptoms of tabes recede as optic atrophy progresses. Since that time a number of writers have published cases which, in a measure at least, substantiate his first statement. Dejerine (*Societe de Biologie*, June 22, 1889) particularly maintaining that it is rare to find a blind tabetic who presents the signs of the second stage of tabes, and that in the majority of cases the advent of blindness is coincident with an amelioration or cessation of pains. My experience is entirely at variance with these views and with one exception, possibly two, I have never seen the course of the disease modified in any way by the advent of blindness. So far as the appearance of ataxia in amaurotic tabetics is concerned, I have a patient under observation now, as he has been for the past seven years, who did not become ataxic until two years after blindness was complete. It must not be forgotten that ataxia is itself a late manifestation in a large proportion of cases, while optic atrophy is comparatively an early one. The disease exists for years in many cases and is to be diagnosticated from the symptoms and the signs long before ataxia sets in, and all clinicians seem to be agreed that if optic atrophy does not set in in the earlier years of the disease it is not likely to occur at all. If blindness occurs in a benign case of tabes it may

well be seen that the occurrence of blindness has an apparent ameliorating effect upon the disease, but that it has any real effect to alter its course I am unwilling to believe. This connection is a favorable one, to refer to some views emitted on the subject of tabes with blindness by Marie and Switalski at the International Medical Congress at Paris in 1900. They attempt to distinguish two varieties of tabes with blindness: (1) Tabes with papillary atrophy and (2) the papillary atrophy of tabetics. Under the first they classify patients who have all the phenomena of tabes, often to a very pronounced degree, with ataxia, Rombergism, and serious disturbances of nutrition. Under the second the clinical aspect is very different, the patients are well nourished, with the appearance of health and there exists no trophic trouble. The clinical symptoms of tabes, *i.e.*, the pains, the ataxia, and the vesical trouble show themselves to a very slight degree. From a nosological point of view they believe that we are probably not concerned with an essentially distinct morbid species in these two forms of tabetic blindness because the etiology of both is the same, viz., syphilis, but that there is a different localization of the same process, or perhaps even of a different process, at the basis of it. Although the wisdom of such an attempt at classification or subdivision is very doubtful, nevertheless we encounter cases which correspond with it. I do not recall whether there are any autopsies recorded upon the second class of cases mentioned by these writers. Unless there are, and the findings in the cord correspond to those of tabes, it may be considered questionable whether the form of disease described under (2) should be admitted under the heading of tabes at all.

I have encountered three such cases during the period that 153 cases have come under observation. The last patient that I saw is so typical of this variety that I shall quote it here. Mr. T., fifty-seven years old, an actor, had syphilis when about thirty years of age. For this disease he was treated for about one year with mercury and iodide of potassium. A few years after the syphilitic infection he had a very mild attack of iritis. Aside from this he remained well until he was forty-seven years old. He came home from the theater one night in his usual health, went to bed and to sleep. About 2 A. M. he was awakened with a boring sharp pain in the chest. This continued for several hours and then gradually passed away. After it ceased he had a sensation in the eyes as if they were dancing and when he tried to get up he felt giddy. As the result of all this and of the pain in the chest and in the epigastrium, which recurred every now and then, his nerves gave way and he had what he calls an attack of "nervous prostration" which lasted five weeks. During most of this time he was confined to bed. When he tried to stand his legs bent beneath him. No other details of this illness can be got save the trouble with his sight which began at this time. He says that everything that he looked at kept dancing before his eyes. From that time his sight began to fail progressively and continued until a year ago when he became entirely blind. His account of the way in which the vision failed is so characteristic of tabetic amaurosis that it deserves to be quoted. During the first few years of failing sight he says he could see objects very well, providing he stopped and looked at them directly ahead, but if he wished to take in many objects at a glance it was very difficult, they were blurred and indistinct. In other words, he had to have the object fairly ahead of him and to focus steadily upon it. Gradually his sight became so affected that things that he focused had the appearance of being seen through the large end of a telescope. The visual field got steadily smaller and smaller until it narrowed down to a pin-point aperture. During these eight years when he was losing his sight he says that he felt fairly well save that at times he had sharp darting pains throughout different parts of the body and at times a sensation in the right thigh as if it were asleep. He has also had at times difficulty in passing water, occasionally he has to wait some time before starting the stream and to press hard in order to empty the bladder but he considers that his bladder performs its function well. He has had at times a girdle sensation around the lower part of the abdomen. He is still fairly potent.

Examination shows practically no ataxia of locomotion or station, there being slight unsteadiness when he stands on the left foot. There is no ataxia of the upper extremities. There is slight diminished keenness of sensibility from below the spine of the scapulæ to about the eleventh dorsal vertebra and extending around the body. The tendon-jerks are all very lively, the plantar-jerks, the cremaster jerks and the abdominal jerks are normal. The pupils are large and unresponsive to light. There is complete primary atrophy of both optic nerves. The left iris shows some indication of previous inflammation. The left ear gives evidence of nerve deafness.

One may consider the disease process in this patient a variety of tabes or he may not. If he puts it in that category it is clearly a very atypical case and one is not justified in making deductions anent the prognosis of ordinary tabes from it or from any number of such cases.

It was only by careful questioning that any symptoms whatsoever were elicited, and taken by themselves the symptoms so elicited have little diagnostic significance. The physical signs would not justify the diagnosis of tabes. Nevertheless, this may be taken as a fairly good example of amaurotic tabes. The point that I wish to make here is that from a prognostic point of view it is quite a different disease from ordinary tabes.

The prognosis is worse in cases of brusque onset. Although in many such cases the symptoms ameliorate, often the disease has incapacitated the patient, and although in some instances there is considerable restitution of function, in the majority of cases the disease pursues a rapid course especially if associated with symptoms indicating

profound disorder of the sympathetic nervous system.

The prognosis is far better in those cases in which the disease is of slow and insidious onset, than in those in which it has developed abruptly. It is incontestable that the longer the onset of ataxia is delayed the less grave is the prognosis. It is my experience that as the disease conforms itself in the beginning so does it continue to do during its entire course. The disease seems to advance more rapidly in patients in which tabes developed within a comparatively short time, say ten years after a syphilitic infection, than when it develops much more tardily and the prognosis is distinctly worse in these cases. One reason for this is that exudative lesions of syphilis in the blood-vessels and viscera may not only lower the patient's vitality and recuperative capacity, but mediate intercurrent conditions such as apoplexy which causes the patient's death directly. The prognosis is much more unfavorable in high tabes, cervical and cervicobulbar tabes, than in the common variety. Why encroachment of the oblongata by the disease process should make the prognosis grave is readily apparent. It adds the terrors and dangers of bulbar palsy. Death is very rarely caused directly by tabes, but by some such accident as the pneumonia of swallowing, syncope and pharyngeal paralysis leading to asphyxia.

Early involvement of the nerve supply of the larynx is an unfavorable symptom. I have seen one case in which this complication, occurring comparatively early in the course of the disease, caused paralysis of the adductors of the vocal cords which necessitated immediate tracheotomy to cut short an attack of asphyxia which threatened the patient's life. Another patient in which the outlook was grave because of the sudden onset of the symptoms and early development of laryngeal symptoms, was Case XI, recorded in the MEDICAL NEWS, March 14, 1903.

The course of the disease seems to be more rapid in women than in men. Out of 20 cases of the disease in women, only one was benign. Although this is too small a number from which to draw conclusions, benign cases seem to be frequent in males. The most brusque and rapidly progressive cases that I have seen have been in women and especially in those in whom no history or indication of syphilis could be obtained.

The disease seems to advance more rapidly in young tabetics under thirty-five years of age than in those who develop the disease later in life. At least that has been so in the patients under my observation. Another fact that has been noted about these cases in comparatively young adults, is that the disease after reaching a certain stage, oftentimes incapacitates the patient, the progress seems to cease for a long time and under treatment restitution of certain functions is brought about.

The prognosis is worse in those whose occupation necessitates standing or fatiguing use of the legs. Anything that contributes to leg weariness tends to facilitate the rapidity of the course of the disease. This is one reason why we encounter such a disproportion of comparatively recent tabetics in our large public hospitals. Their social and hygienic environment, intemperate use of spirits, and the necessity for earning their daily bread, all combine to make the course of the disease more rapid.

The prognosis of tabes to-day differs from that of twenty-five years ago because the disease has apparently undergone clinical transformation. We no longer see the type of tabes delineated by Duchenne, Romberg, Charcot, Seguin or any of the clinicians of the previous generation and to which the name "Progressive Locomotor Ataxia" seemed so apt and so descriptive. The symptoms are less severe, the course of the disease is less progressive and what may be called aberrant forms or forms "frustes" of the French writers are more common. I very rarely nowadays see in private or hospital practice, the very pronounced form of the disease which I saw ten or fifteen years ago. To be sure there are gathered together in almshouses and hospitals for incurables a few cases of this pronounced type.

What the explanation is of this change in the clinical delineation of tabes it is not easy to say, moreover, no one factor is entirely responsible for it. In the first place early and atypical tabes are recognized by the general practitioner and by the specialist so much more frequently to-day than they were even a few years ago, that this must, in a measure, account for the impression that many of us have received that the disease does not display itself as formerly. In the article on the symptomatology I called attention to the fact that objective symptoms of the disease are not infrequently present for years before the subjective symptoms. It naturally follows that if one encounters a number of these cases and has them under observation for a protracted time, and no very severe symptoms develop he becomes convinced that the disease is not the same as it used to be. On the other hand, it may well be that the treatment has had something to do with bringing about this condition. Although we are still in the lamentable position of having no specific for tabes and in fact, of having no medicament which we can say positively will alter the course of the disease, nevertheless we have learned empirically that conformation to a certain regime, mode of life, dietary, medical therapy, massage, hydrotherapy, climatotherapy and electrotherapy has not infrequently such influence upon the disease that the process seems to stop advancing while they are being employed.

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**The Germ of Rabies.**—Dr. A. Negri, Golgi's assistant at Pavia, announced last March the discovery of the specific micro-organism of rabies. After further investigation he states that he has examined more than 100 dogs with natural or laboratory rabies, and has never failed to find the specific micro-organism in the nerve centers. On the other hand, he has never found it in other dogs.

## THE TOXIC ACTIONS OF UROTROPIN: WITH REPORT OF A CASE OF HEMATURIA AND HEMOGLOBINURIA FOLLOWING A DOSE OF SEVEN AND ONE-HALF GRAINS.*

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Urotropin is an unstable chemical compound formed by the action of formaldehyde on ammonia. It is readily decomposed, with the liberation of free formaldehyde, by feeble acids and even acid salts, as acid sodium phosphate of the urine. Other trade names are aminoform and cystogen.

Nicolaier first employed urotropin in 1894 as a diuretic and uric acid solvent. Later he recommended it as a urinary antiseptic. He began its administration in doses of 120 to 150 grains a day, and even gave as much as 150 grains *at one dose* without ill-effects. But larger experience taught him that unpleasant symptoms might result from daily doses of even 90 grains. He has never seen, however, any ill-effects from daily doses of less than 30 grains. As urotropin came into general use, toxic effects were occasionally observed after as small a dose as 15 grains a day and, in the case which I shall describe presently, after a single dose of seven and one-half grains.

When one considers the extent to which urotropin is administered, the limited number of cases reported in which its use has been attended by toxic effects confirms the general belief in its freedom from such effects. Yet the fact that it may prove toxic, perhaps from idiosyncrasy, must not be lost sight of. It is the purpose of this paper to call attention to such toxic actions as have been reported.

Individuals vary greatly in their susceptibility to urotropin, and Keyes states that the same patient may vary in susceptibility at different times. Children bear urotropin well, though somewhat smaller doses should be employed.

Urotropin is sweetish, with a somewhat bitter after-taste, but when well-diluted is practically tasteless. All who have used urotropin agree that it should be freely diluted for administration—that a dose of 7½ grains should be dissolved in at least half a pint of plain or carbonated water at ordinary temperature, and larger doses in proportion—or irritation is likely to occur. In view of the large quantity of water to be taken with it, urotropin should be administered when the stomach is empty, that is, before or not till two hours after meals. Nicolaier and Richardson give urotropin after meals, but the majority of writers advise that it be given "morning and evening," which means, I take it, on an empty stomach.

*The physiological actions* of urotropin have not yet been definitely worked out, as is evident from the conflicting statements found in the literature. As has been stated, Nicolaier first recommended urotropin as a diuretic and uric acid solvent. Later he found it to be a powerful urinary antiseptic. The only other action that has since been attributed to urotropin is its power of correcting phosphaturia, as stated by Casper.

Urotropin is quickly absorbed, since its elimination by the kidneys begins within ten minutes after administration. The duration of its presence in the urine depends upon the size of the last dose. Nicolaier, giving 7½ grains, found that it disappeared in thirteen hours; with 22 grains, in twenty-seven hours; and he states that even after 90 grains per day, it soon disappears. Cammidge, giving 30 grains a day to a healthy adult, found urotropin in the urine for twenty-six hours. Nicolaier thinks Casper's observation that urotropin persisted in the urine for fourteen days after the last dose is probably erroneous.

It is believed by most investigators that urotropin circulates in the blood in its own form. Casper found free formaldehyde in the blood of a rabbit to which urotropin had been given subcutaneously, but not in the blood of patients taking the drug. Loebisch and Linoissier claim to have detected formaldehyde in the blood after the administration of urotropin. The fact that urotropin is excreted unchanged by the kidneys is evidence against its decomposition in the blood under ordinary circumstances. Perhaps is those cases in which formaldehyde has been found in the blood, it has been liberated under the action of the acid gastric juice and absorbed as such.

The fate of urotropin after it enters the urine is still a subject of contention. Formaldehyde cannot be demonstrated in the urine of all patients taking urotropin, yet clinical experience proves that some antiseptic body is present.

Part of the urotropin excreted by the kidneys is undoubtedly partially or completely decomposed in the urine, if it is acid in reaction, and it is probable that this decomposition occurs, at least in part, in the renal tubules. From the clinical evidence of its action in cases of cystitis with ammoniacal urine, and the well-founded assumption that urotropin is not decomposed in alkaline solutions at the body temperature, the extent of this decomposition before the urine reaches the bladder must be considerable. Cammidge failed to find formaldehyde in the urine of a healthy adult taking 30 grains of urotropin per day, and concluded that the exact chemical nature of the body which acts as a urinary antiseptic is unknown. He believes, however, that acid urines produce partial decomposition of urotropin in the kidneys at which time the antiseptic element is formed, and emphasizes the fact that such decomposition takes place only in the presence of *acid urine*. Hence drugs which diminish the acidity of the urine should not be given in conjunction with urotropin.

Others, however, notably Nicolaier, Loebisch and Casper, contend that free formaldehyde is split off in the urine. Citron, while admitting this, thinks that the formaldehyde immediately

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re-combines with some substance in the urine, probably the sodium salts, and does not exist there as such. Nicolaier has found by *in vitro* experiments that formaldehyde splits off from urotropin in the presence of uric acid, and believes that formaldehyde is liberated in the body in this manner.

We may sum up these opinions as follows: Urotropin is always found in the urine of patients taking it; formaldehyde is found in some cases; and an antiseptic action is almost always manifest.

Whatever may be the manner of its action, urotropin is the most potent and at the same time the most reliable *urinary antiseptic* we possess. Urotropin, however, is not suitable in all cases where urinary antisepsis is desired. Keyes considers that the drug is distinctly irritating to the urinary passages and that in straightforward cases of chronic posterior urethritis and acute cystitis it may do more harm than good. This opinion is based on extensive clinical experience, but is not shared by many who are equally well qualified to speak. Hahn says urotropin is practically useless in bladder cases when the urine is acid in reaction.

The *diuretic action* of urotropin, though marked at times, is not constant. How urotropin acts as a diuretic is not known, but as it rather lowers blood pressure in large doses, it is probable that it acts through local stimulation of the kidney cells.

The action of urotropin as a *solvent of uric acid* and even of uratic calculi has been highly praised, but it has not fulfilled the expectations of its advocates, as the experiments of Casper and Mendelsohn have shown.

Casper claims that urotropin relieves *phosphaturia* in a remarkable manner.

As the literature on the therapeutic actions of urotropin is rather full no further space need be given to it, and we may turn our attention to its toxic actions, using the term to include all untoward effects.

The toxic actions of urotropin, reported to date, as far as I have been able to find after a thorough search of the literature, include:

*a.—Minor Toxic Actions*, which may be grouped under a single heading.

1. *Irritation of the stomach*, as shown by impairment of digestion and slight malnutrition, has been observed with comparative frequency. Dr. James R. Hayden tells me he has seen it several times. Richardson reports one case of nausea and vomiting, which he attributed to the fact that, contrary to his custom, the urotropin was administered on an empty stomach.

2. *Diarrhea and Abdominal Pain.*—Diarrhea has followed the administration of urotropin in a few cases, accompanied in one instance by abdominal pain. Hematuria also occurred in Forbes' case. Drake-Brockman states that when urotropin is used "as a diuretic, it may cause slight purging, particularly if there be enlarged prostate and irritable bladder." Grosglik has seen urotropin cause diarrhea, but fails to state in how many cases. The diarrhea ceased on the discontinuance of the drug.

3. *Irritation of the Skin with a Measles-like Rash.*—Only one case of this has been reported (Cammidge). It occurred during an experiment on a healthy adult taking 10 grains of urotropin three times a day. The iritation began on the fourth day of the experiment as formication, which was most marked at night and in parts pressed on by the clothing. It became more intense each day and on the sixth day a diffuse red rash, somewhat like measles, appeared. Both the irritation and rash disappeared quickly when the urotropin was discontinued.

4. *Headache and Ringing in the Ears.*—Suppan reports that some patients had headache and ringing in the ears, but states that these effects usually diminished when the use of the drug was persisted in.

5. *Irritation of the Kidneys.*—Ordinarily, urotropin causes no irritation of the kidneys, even when they are the seat of previous disease. In fact Nicolaier states that he has seen the disappearance of albumin and casts as well as blood from the urine under the action of urotropin. Yet urotropin undoubtedly has caused renal irritation. Nicolaier succeeded in producing albuminuria in a rabbit after single daily doses of 150 grains of urotropin. Grosglik states that pains in the region of the kidneys occurred in some of his cases (number not stated) after the use of urotropin, and disappeared on withdrawing the drug. Keyes and R. E. Brown have seen renal irritation result from urotropin. Griffith has reported the following case of albuminuria:

Patient, aged twenty-one years, mild typhoid fever. Up and on a fish diet. Taking 10 grains of urotropin three times a day. On the tenth day, was quite ill with backache, swelling of the eyelids and weakness. The urine was almost solid with albumin. The urotropin was immediately discontinued, with the result that the albumin disappeared by the third day. The patient continued well.

The readiest explanation of the irritant action of urotropin on the kidneys is that formaldehyde as it is split off acts as a local irritant in susceptible cases.

*b.—Irritation of the Bladder.*—This manifests itself under two forms, (1) strangury, and (2) cauterization (Keyes, Jr.) of raw surfaces.

1. *Strangury.*—Irritation of the bladder is perhaps more commonly seen than any other toxic effect of urotropin. Nicolaier stated in his original paper that several patients after continued large doses of urotropin complained of burning in the vesical region, generally after micturition, which radiated along the urethra, and was sometimes accompanied by increased frequency of urination. Examination of the urine in these cases showed only a moderate amount of transitional epithelium and no other abnormal constituents. If in spite of these symptoms, the remedy was continued in the same doses, the trouble increased in severity, and occasionally

red blood corpuscles appeared in the sediment. With diminution in the size of the dose or discontinuance of the drug, the irritation disappeared.

Nicolaier also mentions a case of cystitis, probably of several years' duration, with ammoniacal urine and only slight vesical pains, in whom the pains were increased by the administration of 90 grains of urotropin a day. With doses of 7½ to 22 grains per day, the pains were not present, or at most, only transient.

Wider experience with urotropin has shown that vesical irritation, even with proper dilution of the drug, is not an infrequent result of its action. Keyes believes that urotropin is distinctly irritating to the bladder and states that, though this belief is at variance with many authorities, it is founded upon extensive clinical experience. As already said he has found that in straightforward cases of chronic posterior urethritis and acute cystitis, urotropin may do more harm than good.

The vesical irritation may vary from slight increase in the frequency of micturition to intense strangury, accompanied by the presence of blood in the urine. The tendency to vesical irritation is proportional to the size of the dose only in general terms: it appears to be due rather to individual susceptibility. I have seen a single dose of 7½ grains of urotropin, properly diluted, produce such intense strangury that opium and hyoscyamus suppositories had to be given for relief, yet Nicolaier has administered as much as 90 to 150 grains daily without such effects.

It is undoubtedly true that in many instances the vesical irritation has been attributable to the fact that the urotropin has been administered in too concentrated form.

2. *Cauterization of a Raw Surface.*—In this connection an observation made by Keyes, Jr., of an irritant action of urotropin on an operation wound of the bladder is of interest. The observation in brief was as follows:

After suprapubic prostatectomy the lower part of the wound which was left open for drainage and was bathed with urine containing urotropin (5 grains, t. i. d.) became covered with a leathery slough by the second day, and remained in an unhealthy condition until (eighteenth day) the urotropin was discontinued. Afterward the wound healed uneventfully. He has seen a similar reaction in a wound of the scrotum which had been irrigated with formaldehyde. While he believes that this tendency to slough under the action of urotropin is a personal idiosyncrasy, he thinks that the fact should be kept constantly in mind.

Ehrmann has reported a case in which urotropin acted somewhat similarly: Patient, aged twenty-five years, tuberculous infiltration of the prostrate, tuberculous cystitis and ulcers of the urethra. The administration of urotropin was followed by improvement in the condition of the urine, but the patient complained of burning along the urethra which was probably due to the action of urine containing formaldehyde on parts of the urinary passages denuded of epithelium.

*c. Hematuria and Hemoglobinuria.*—As already stated, Nicolaier observed the presence of red blood cells in the urine after large doses of urotropin, especially if the drug was not discontinued or its dose diminished after the occurrence of strangury. In a case of tuberculous cystitis reported by him, urotropin caused the appearance of red blood corpuscles in the urine, but not in sufficient number to give it color. Nicolaier produced hematuria experimentally in dogs with urotropin, but only after the administration of single daily doses of 230 grains.

A careful search of the literature has brought to light *seven cases of hematuria* caused by urotropin, with one doubtful case, as the patient was taking turpentine in addition to urotropin. Hayden, Swinbourne, Johnston and Keyes, Jr., who use the drug extensively, tell me they have never seen it cause hematuria. In a case which has come under my observation there was marked hemoglobinuria in addition to the hematuria, the number of red cells being totally inadequate to account for the amount of hemoglobin.

*Case I.*—Reported by T. J. L. Forbes. Patient aged sixty-two years. Cystitis of ten days' duration. The urine was ammoniacal and contained pus but no blood. Prostate enlarged. Urotropin was given in 10-grain doses thrice daily, dissolved in half a pint of warm water. Two days later the urine was better. On the third day the patient complained of dysuria, burning along the urethra, abdominal pain with diarrhea, and had marked hematuria. The urotropin was immediately discontinued; by the fifth day the blood had disappeared and the urine had become ammoniacal. The urotropin was resumed, but in smaller doses—5 grains t. i. d.—and again, after the third dose, there were strangury and hematuria. Forbes believed that the bladder was the source of the hemorrhage.

*Case II.*—Reported by W. A. Milligan. Girl aged fifteen years; given 5 grains of urotropin three times a day to produce diuresis. After taking the drug for seven days the patient suffered from an uncomfortable sensation in the bladder, accompanied by increased frequency of micturition. Hematuria followed and according to the patient was pronounced. Thinking nothing was wrong, she continued to take the urotropin two days longer, and as her condition became worse sought advice. Examination of the urine showed a large amount of blood. The urotropin was immediately discontinued, with the result that the hematuria ceased and the urine became normal in two days' time.

*Case III.*—Reported by W. Langdon Brown. Patient aged thirty-three years. Typhoid fever. Ailing for some weeks, ill and delirious for four days before admission. Given urotropin, 10 grains three times a day. Two days later complained of pain and dysuria. On the seventh day, blood was present in the last portion of the urine. On the eighth day, blood was seen oozing from

the meatus, and a little more blood was seen the same evening. The urotropin was stopped, and on the ninth day, the dysuria and blood had disappeared.

*Case IV.*—Reported by W. Langdon Brown. Patient aged twenty-four years. Typhoid fever. Ailing for a few weeks. Ill in bed for two days before admission. Given 10 grains of urotropin three times a day. On the sixth day the patient suffered from pain and dysuria. On the seventh day blood with actual clots appeared. The urotropin was stopped. The following day the condition had improved, and soon entirely disappeared.

*Case V.*—Doubtful. Reported by W. Langdon Brown. Details not given. Author simply states that a typhoid fever patient taking urotropin developed hematuria, but that the patient was also taking turpentine, and hence the hematuria cannot be charged entirely to the urotropin.

*Case VI.*—Reported by Alfred Gordon. Patient aged twenty-nine years. Cerebrospinal syphilis with cystitis. Given 5 grains of urotropin three times a day. By the end of a week the pus had diminished in quantity. Four days later, or about the eleventh day, blood appeared with each urination. The urotropin was stopped and the hematuria disappeared. After an interval, urotropin was again given with the same result.

*Case VII.*—Reported by Nicolaier. Patient, a boy aged eleven years. Difficulty in passing urine for six weeks but no pain. At night urine was passed involuntarily. His lungs were unsound and albumin, pus cells and tubercle bacilli were found in the urine. There was pain in the kidney region. He was given 3¾ grains of urotropin twice daily, which he bore well, but without effect on the urine. One year later patient returned for treatment. Urinary organs in same condition. Few red blood cells in the urine, but not enough to color it. Given 3¾ grains of urotropin four times a day. After a week of this treatment there was not only no improvement, but hematuria had occurred. The blood dropped to the minimum when the drug was discontinued. Again the urotropin was given and again the hematuria appeared. The drug was withdrawn and the urine returned to its former condition.

*Case VIII.*—Reported by H. C. J. Biss. Female, thirty-three years old, suffering with typhoid. Bacilluria on fifty-fourth day. Urotropin was given in 10-grain doses thrice daily. Strangury occurred four days later. On the thirteenth day hematuria accompanied the strangury. The urotropin was then discontinued. The strangury disappeared in two and the hematuria in four days.

*Case IX.*—Personal observation. This case possesses unusual interest from two standpoints, the occurrence of cystitis as a complication of pneumonia,* and the development of hematuria and hemoglobinuria within twenty-four hours after the administration of 7½ grains of urotropin. A woman, aged seventy-three years, was taken ill with pneumonia. Seven days later, before the lung had cleared, the patient complained of a burning sensation in the region of the bladder with increased frequency of micturition. This condition had developed without previous catheterization or other interference with the bladder. Examination of the urine showed a few pus cells as the only abnormal feature. The vesical irritation gradually increased in intensity during the next four days in spite of treatment, and during the afternoon of the eleventh day the urine became very cloudy. By the following morning it was ammoniacal. At 10.25 that morning the patient was given 7½ grains of urotropin dissolved in half a pint of water. (The frequent intervals at which the patient was taking nourishment threw the urotropin within an hour after she had had 3 oz. of squeezed beef.)

By two o'clock intense strangury had developed from which she got no relief in spite of the free use of opium and hyoscyamus suppositories, until 7 o'clock. I withheld the urotropin after the first dose but that night ordered another tablet for 7 A.M., without cautioning the nurse not to give it in case the urine became bloody. At 4 A.M. or 17½ hours after the urotropin was given, the urine was deeply blood-stained, and at 7 o'clock as ordered—before my morning visit—the second tablet of urotropin was administered, this time on an empty stomach.

The chief points in the examination of this urine were, its alkaline reaction, dark red color (absorption bands of reduced hemoglobin), heavy cloud and gelatinous sediment, large amount of mucus, pus cells, epithelium (some cells from bladder) and red blood corpuscles.

Though the red blood corpuscles were numerous, their number was not sufficient to account for the amount of hemoglobin present, so that we must recognize the presence of hemoglobinuria as well as hematuria. A careful search was made for blood casts, but none were found.

Irrigation of the bladder was begun the day the hematuria appeared.

The urine possessed the same characters for twenty-four hours, then its color became lighter, and by night was almost free from blood. The next morning (forty-eight hours after the hematuria developed) the condition of the urine was as bad as ever, but the blood disappeared during the day. On the fourth day (counting from the urotropin) there were only a few streaks of blood, caused evidently by the irritation of the catheter used in irrigation.

The urine was now free from blood till the night of the seventh day, when the catheter again apparently brought away a few streaks (urine passed before the irrigation contained none).

Then on the ninth day the hematuria (without hemoglobinuria) developed again, the urine clearing by the night of the tenth day, and on the eleventh day the urine was free from blood. On

* Hare and Dare in their exhaustive study of the Complications of Pneumonia do not mention cystitis.

the twelfth day the hematuria reappeared, became more marked that night, and though varying in amount did not completely disappear till the night of the fifteenth day.

If urotropin is entirely eliminated from the body within a day or two after its administration, then the reappearance of the hematuria on the ninth day and its paroxysmal nature afterward introduce another element into the case which will be discussed later. As neither a bacteriologic nor cystoscopic examination was to be thought of except as a last resort, two important points must remain undetermined—the bacteriological cause of the trouble and the state of the bladder wall.

The urine now remained free from blood for nearly four days and the vesical irritation became much less distressing, yet the evidences of cystitis persisted unabated. The urine was very foul, containing so much mucus that it would block a large catheter, large numbers of pus cells, and so many triple phosphate crystals that small concretions often came away in spite of two thorough irrigations a day.

In view of the condition of the urine and the uncertainty in my mind as to the extent to which the urotropin was implicated, I determined to give the drug another trial. It certainly was indicated. Accordingly I ordered another dose of 7½ grains dissolved in half a pint of water. The drug was given at 5:45 A.M., three-quarters of an hour after milk. Within three hours strangury had developed and in 4¼ hours the hematuria and hemoglobinuria returned. By night the strangury had diminished and the condition of the urine improved. The blood disappeared by morning and there has been no return of it. As I write, six weeks later, the bladder has returned to practically a normal state, only a few pus and epithelial cells remaining.

The reappearance of the strangury, hematuria and hemoglobinuria, after the urine had remained clear for nearly four days, within five hours after the dose of urotropin and their disappearance within twenty-four hours after withdrawal of the drug, seem to justify me in the conclusion that urotropin was the immediate cause of the hematuria and hemoglobinuria.

If this conclusion is warranted, then the condition of the urine during the sixty hours following the first administration of the drug is directly attributable to it. But some other explanation must be offered for the return of the hematuria on the ninth day and its paroxysmal nature for the six succeeding days, because no urotropin had been given. The most plausible assumption is that of ulcer of the bladder wall. There was presumptive evidence of this in the great distress which the irrigations caused and in the fact that several times urine passed but a short time before the passage of the catheter for irrigation would be clear, while that which came away through the catheter would contain blood, particularly toward the end. The diagnosis, of cystitis with ulceration of the bladder wall, while not absolute for lack of a cystoscopic examination, seems justified by the facts.

The hematuria and hemoglobinuria after the first adminstration of urotropin lasted sixty hours, after the second for twenty-four hours. The explanation of this difference lies in the fact that two doses of seven and one-half grains each were given at an interval of about twenty-one hours, on the first occasion. It would be interesting to know to what extent the condition of the bladder wall contributed to the production of the hematuria, or if in this case hematuria would have occurred without a preexisting anatomical change in the bladder wall.

Concerning the source of the blood in hematuria caused by urotropin, Forbes has expressed the opinion that it comes from the bladder and the fact that in one of W. Langdon Brown's cases blood was seen to ooze from the meatus urinarius confirms this opinion. In my own case I was led to the same conclusion.

As in all of the cases of hematuria, strangury has preceded the presence of the blood, this symptom should be looked upon as an indication of danger.

Johnston has observed two cases in which hematuria disappeared while the patients were taking urotropin.

*Case I.*—A girl aged twenty-two years, was taken with characteristic symptoms of catarrhal grip. Hematuria and hemoglobinuria appeared two days later. Blood was present in such quantity that clots formed in the urine on standing. She was given 7½ grains of urotropin three times a day to prevent bladder infection, and the urine cleared absolutely in five days.

*Case II.*—Male, aged thirty years, teamster, was perfectly well previously. Hematuria followed lifting a heavy piece of furniture, and was marked. Given 7½ grains of urotropin three times a day. The hematuria had improved after four days and was gone in a week.

Since the physiologic and therapeutic actions of urotropin are due to the liberation of formaldehyde in the dissociation of the urotropin molecule, re-combinations aside, it will be interesting to inquire to what extent the toxic effects of urotropin have been reproduced by intravenous injections of formaldehyde.

Robert Maguire has performed three remarkable experiments upon himself with formaldehyde. The facts of these experiments will be seen to have important bearings upon the toxic actions of urotropin.

Maguire had his house physician inject 100 cubic centimeters of a 1:2,000 solution of formaldehyde into a vein of his arm. Formaldehyde appeared in the urine in about one hour, the urine became abnormally acid and contained albumin. In another hour the urine had returned to normal.

In this experiment 0.064 grm. of formaldehyde was used, giving approximately 1:100,000 of total blood. A few days later 263 cubic centimeters of a 1:2,000 solution of formaldehyde were

injected into a vein rather quickly. The solution gave out or Maguire would have taken more. "Immediately," he says, "hematuria and hemoglobinuria appeared." An hour later the urine was still more bloody. Then, when passing urine four hours later, he found that small blood clots had formed in the bladder, which were expelled with difficulty. Considerable irritation of the bladder was present. Still later, the urine was of a brownish tint, but contained no ordinary albumin or ordinary blood-coloring matter. (He was unable to collect the urine for a complete examination.) The following day all the urinary changes had disappeared.

The amount of formaldehyde used was 0.168 grm. giving approximately 1:40,000 of total blood.

On still another occasion Maguire took 63 cubic centimeters of a 1:1,000 solution of formaldehyde. The experiment was stopped because of "extreme cramp-like pain and faintness." There was great irritability of the bladder but no urinary change. A mild but troublesome attack of dysentery developed, the intestine pouring forth a great quantity of mucus. Shortly after the injection he suffered from severe bronchial catarrh, in fact from catarrh of nearly all the mucous membranes, as far as could be ascertained, except the stomach. The amount of formaldehyde used was 0.081 grm.

These experiments are suggestive from several standpoints and throw at least some light upon certain hitherto unexplained actions of urotropin. They prove that under certain conditions formaldehyde may cause hematuria and hemoglobinuria, and suggest that when urotropin causes strangury the cause is the liberation of free formaldehyde in the urine. The appearance of the red blood corpuscles in the urine immediately after the injection and the presence of blood clots four hours later seem to implicate both bladder and kidneys in the production of the hematuria and to prove that the immediate cause of the bleeding is a local irritant action of the formaldehyde.

Ewing, Park and Payne have found from experiments on rabbits that intravenous injections of dilute formaldehyde solutions cause destruction of red blood corpuscles. The estimated proportion of formaldehyde in the blood in one of Ewing's rabbits, 1:11,000, was much higher than in Maguire's experiment upon himself, 1:40,000, yet only in Maguire's case did hematuria and hemoglobinuria occur. Nor is any change in the urine recorded in the experiments of Park and Payne.

We find, then, that all the more important toxic actions of urotropin (intestinal irritation, renal irritation, strangury, and hematuria and hemoglobinuria) have been produced by intravenous injections of formaldehyde.

Prof. Witthaus informs me that one gram of urotropin yields, in complete decomposition, 1.2842 grams of formaldehyde. The amount of formaldehyde employed in Maguire's second experiment and which caused such severe toxic symptoms, was 0.168 grm. Here we have further evidence that urotropin when given by mouth is only partially decomposed in the body, and from the presence of urotropin itself in the urine, that this decomposition takes place only, or at least chiefly, after its excretion by the kidneys. In the single case in which hemoglobinuria occurred after administrating urotropin, it must be assumed that the drug was decomposed either in the stomach or in the blood, since the hemoglobinuria cannot be accounted for on any other assumption.

*Conclusions.*—1. That the administration of urotropin may be, but is only rarely, attended by toxic effects.

2. That toxic actions (especially strangury) occur with comparative frequency if the urotropin is not properly diluted.

3. That the development of toxic effects is not always, or necessarily, correlative with the size of the dose of urotropin.

4. That individuals vary greatly in their susceptibility to the action of urotropin.

5. That urotropin has been known to produce the following toxic effects:

A. *Minor Toxic Actions.*—(1) Irritation of the stomach; (2) diarrhea and abdominal pain; (3) measles-like rash; (4) headache and ringing in the ears; (5) renal irritation, sometimes with albuminuria.

B. *Irritation of the Bladder.*—(1) Strangury, the most common of the toxic effects; (2) irritant action on raw surfaces in the urinary passages.

C. *Hematuria and Hemoglobinuria.*—Eight positive cases of hematuria, following the administration of urotropin, and one doubtful case, have been reported. In one case hemoglobinuria was associated with the hematuria.

6. That the more important of these toxic actions have been produced by intravenous injections of formaldehyde.

7. That the toxic actions of urotropin are due either (1) to special susceptibility to the action of formaldehyde or (2) to interference with the usual disposition of formaldehyde in the body, or (3) to the liberation of an unusual quantity of formaldehyde.

8. That the toxic effects of urotropin generally disappear completely within a few days after withdrawal of the drug.

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## OBSERVATIONS ON EIGHTEEN ABDOMINAL SECTIONS, PERFORMED WITHIN THE PAST YEAR, INCLUDING THE SUCCESSFUL REMOVAL OF AN OVARIAN CYSTOMA WEIGHING SEVENTY-TWO POUNDS.*

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During a period of a little over twelve months I have performed 18 abdominal operations for various conditions existing within the abdominal and pelvic cavity. These were as follows:

Five for ovarian cyst; five for cystic disease of ovary; four for appendicitis; one for intestinal obstruction; one for ruptured tubal pregnancy; two myomectomies for uterine fibroid.

In addition to these I have performed vaginal section twice, once for suppurating pelvic hematocele, and once for pelvic abscess. None of the patients operated upon were from the service of any hospital, some being seen with and operated upon for fellow practitioners. In several of the cases the diagnosis was made by the attending physician before I saw the patient.

I have no wish to take up your time stating the cases in detail, but some of them call for comment at my hands, in that these present some features of interest and demonstrate the value of surgical interference, which is looked upon much more favorably by a discriminating public to-day, the suggestion by the surgeon that an operation is required finding a more ready response from the patient. No surgical procedure, however, should be advised or adopted except there be a reasonable hope that it will result in the cure or marked relief to the patient. Unfortunate results have followed operations performed as a last resort, as well as operations attempted by those whose opportunities have been too limited to fit themselves for the work.

The fascination of abdominal surgery, the brilliant results achieved, and its increasing scope but stimulates our attention to its importance. The incision by McDowell, that marked the birth of successful ovariotomy; the successful operation for vesicovaginal fistula, through the master-hand of Marion Sims, which gave birth to the surgery of diseases of women; and the recognition by Lawson Tait of the true pathology and diagnosis of ovarian and tubal disease and their imperative removal: these are distinctive as well as progressive periods. The perfected work in pelvic surgery to-day, the treatment of inflammatory diseases of the ovaries and tubes, of pelvic hematocele, of fibromyomata, of uterine displacements, these and others lead us to appreciate the difficulties and helplessness of surgeons who have preceded us in this field. The axiom of Lawson Tait "When in doubt, make an exploratory incision" has proved the searchlight in pelvic surgery, and the morbid specimens thus removed gave an impetus to the science of pathology by affording an opportunity for interesting study. As the etiology of pelvic disease has been more closely defined so has the treatment of the various conditions advanced upon a more scientific basis.

The class of cases first to be referred to is that of ovarian cyst. In one of the five patients upon whom I operated the tumor weighed 72 pounds. This patient, aged twenty-seven years, had been married seven years and was sterile. About the time of her marriage she noticed a slight enlargement on the left side of the abdomen, which steadily increased in size, her abdomen being enormously distended at the time she consulted me in November, 1901, she having considerable difficulty in breathing and being obliged to sleep in a semi-reclining position because of abnormal pressure. Examination showed the uterus to be but slightly enlarged and anteverted. I made a diagnosis of ovarian cyst and advised operation, to which she subsequently consented. Upon abdominal section, April, 1902, the diagnosis was verified, when I removed an enormous unilocular cyst of the left ovary, the contents, of a turbid, syrupy consistence, containing varied-sized fat globules, measuring 6¾ gallons and weighing with the removed sac 72 pounds. The shock to the patient in the removal of such an enormous tumor was much less than I anticipated, though this may be accounted for in great part by the fact that I evacuated the contents gradually, twenty-five minutes being taken therefor, preliminary to enucleation of the sac. The adhesions were profuse, numerous bands necessitating ligation with catgut; the pedicle of the tumor or sac was four inches broad, enucleation of which being by what I term an Odd-Fellow's signia chain ligature of heavy twisted silk, followed by a re-enforced double-loop ligature. The walls of the sac varied from one-eighth to one-third of an inch in thickness. As the adipose tissue of the abdomen was 1¼ inches in thickness, the patient having weighed 227 pounds previous to operation, I concluded to suture the peritoneum separately with catgut, using the interrupted Lambert suture; the fascia and muscle were then brought in perfect apposition with heavy catgut, and the remaining wound left to

* Read at the Thirtieth Annual Meeting of the Florida State Medical Association, held at St. Augustine, April 8 and 9, 1903.

close by granulation tissue, with dressings of iodoform gauze, the wound being entirely and firmly closed at the end of six weeks. Time of operation, one hour and twenty minutes; highest temperature, 99½° F., on the third day. The right ovary and tube, apparently normal, were not removed. When last seen by me, five months after operation, the patient was in perfect health, the cicatrix being firm with no tendency to ventral hernia.

The other case in this class which I wish to make mention of was a woman aged sixty-five years, married and also sterile. When referred to me she had just recovered from an attack of traumatic peritonitis, on the left side mainly, and it was at this time that a growth was noticed on the right side by the attending physician, the patient never having been conscious of such until so informed. Upon examination the diagnosis was made of ovarian cyst, mobility being independent of the uterus. An abdominal section showed the tumor to be a right parovarian cyst the size of an ordinary grape fruit, having a twisted pedicle, with profuse adhesions to intestine and omentum, the result of peritonitis previously referred to. After carefully separating the adhesions the sac was unfortunately ruptured in my efforts to enucleate the growth intact; the peritoneal cavity was irrigated with normal salt solution, no drainage, and the abdominal wall sutured through and through with twisted silk. The patient made a gradual but uninterrupted convalescence.

Of the five cases operated upon for cystic disease of the ovaries, but one will claim your attention, it being one associated with complete retroversion of the uterus with adhesions, the left ovary being three times the normal size, the right sclerotic and somewhat atrophied. This patient, aged twenty-eight years, married two years and sterile, gave the usual history of premenstrual pain, backache, with added irritation of the bladder and frequent micturition. After freeing the uterus from its attachments posteriorly, followed by the removal of both ovaries and tubes, I performed a ventrosuspension of the uterus, a portion of each latero-anterior surface of the fundus being sutured loosely with catgut to the peritoneal tissue at the lower angle of the abdominal wound. These combined operations relieved the patient not only of pain but of the bladder distress as well. In this connection I would note that of the nervous disturbances in women a large percentage is the direct result of inflamed or diseased ovaries and tubes. Where the ovary and tube of one side only is involved we conserve the sacrifice of the opposite ovary and tube.

Of the four cases of appendicitis operated upon by me it was my misfortune to lose two. These deaths, however, can not be attributed to the operator, they being operations of emergency,—suppurative and perforative, and which I was called in haste to perform many miles from Jacksonville. Were it a question of a surgeon's percentage mortality and recoveries my better judgment would have dictated not to operate in these cases; it was the desire of the attending physicians and the parents of both patients that I should give the patients the possible chance, which I proceeded to do. In operations of emergency, even though death be invited, one cannot always decline to operate.

In every case of fatal appendicitis there has been a period in which the patient could have been successfully operated upon. There is no other major surgical operation which is so reasonably sure of success, symptomatically as well as surgically, after early operation, and when prompt interference means as much to the patient as in appendicitis. Elevation of temperature, while a necessity to diagnosis, is no indication of the degree or extent of the pathologic process; furthermore, preconceived ideas based upon experience often prove valueless, as a positive opinion prior to operation cannot be given as to location, attachment or condition of an appendix.

Of the two recoveries, in one, a young man aged twenty-eight years, who was operated upon in May last, temperature being 102⅗° F. at the time of operation, the appendix was of a size of one's little finger, acutely congested and in part gangrenous and bordering on perforation; the omentum was very much injected and partly adherent; this was separated and a portion of the adherent omentum removed; the mesentery attachment was firm with a broad base and pedicle, silk being used as ligature. In this instance the pedicle ligature worked up through a narrow sinus and was extracted two weeks subsequent to operation. This case was of rapid development. The second case of recovery was one of interval operation; by that I mean I operated after a second attack, thus precluding a third attack. The appendix in this instance was rather long and adherent to the cecum, which adhesions were carefully separated before ligation.

The two cases in which death occurred are of interest; in one, a girl aged thirteen years, the disease was fulminating in character, of but three days' duration. The appendix was the diameter of one's thumb, gangrenous and having sloughed at its base, with honey-combed pus pockets and adhesions profuse; septic peritonitis was in evidence. A hard, fecal endolith the size of an orange seed was found in the middle third of the appendix, a condition which in the early days of appendicitis had given rise to the theory of orange, lemon or cherry pits as the chief factor in etiology. The other case, a young man aged nineteen years, temperature 103° F. was what I term one of sacculated suppurative appendicitis, an appendiceal abscess with protective adhesions, in which I removed fully a quart of fetid pus, the abscess cavity being drained by means of iodoform gauze strips carried through a small opening left unsutured in the abdominal wound, the sac not being removed. This case is a remarkable instance of appendiceal abscess with protective adhesions, in which sac there was contained fully one quart of fetid pus which had

been forming some days, the first symptom of appendicitis having developed almost three weeks previous to operation. It is of further interest in that it presented conditions similar to those existing in the case of King Edward VII, operated upon less than a year ago, though in my case the patient's vitality was at a low ebb at the time of operation.

In the case of intestinal obstruction, the patient was aged thirty-three years and single. She had been operated upon about eight years ago by Dr. Joseph Price, of Philadelphia, at which operation the tubes and ovaries were removed. About five years ago she began to complain of a sense of discomfort and dull aching in the right iliac region, which had gradually increased in intensity. Three days previous to my seeing her, in consultation with a fellow practitioner in another city, she presented symptoms of intestinal obstruction. Upon examination of the patient I believed the appendix to be also involved, the conclusion being arrived at by the attending physician and myself that the obstruction of the bowel was evidently the result of some adhesion or fibrous band. Immediate operation was advised and accepted. A loop of the ileum, within a foot of the ileocecal junction, was found strangulated and cyanosed by a fibrous band one inch in length and the diameter of a goose quill, running from the stump left of the broad ligament to the middle portion of an elongated appendix, the latter being very much injected and inflamed. The fibrous band was ligated with catgut at the old stump and the appendix, including the band, removed entire. Patient was entirely relieved of all untoward symptoms and made an excellent recovery.

The fifth class of cases, that of tubal pregnancy, I have operated for twice, both successfully, within the past thirteen months; one by abdominal section three weeks previous to the last meeting of this Association at Tampa and which case I reported with specimen, at said meeting. As a coincidence, I operated upon a second case of ruptured tubal pregnancy within a month of the one reported, though I performed a vaginal section in this instance, with equally good result. The condition was one of suppurating pelvic hematocele, the inflammatory retro-uterine pelvic mass being about the size of a large grape fruit. The patient, aged twenty-nine years, had two children, and gave a history of menstrual suppression and complicated pelvic trouble of several months' standing. A free transverse incision in the posterior vaginal wall and evacuation of the contents of the sac—protective adhesions having confined the contents—was followed by packing the cavity with iodoform gauze and subsequent repeated dressings.

Tubal pregnancy is much more frequent than we have been led to suppose. Formad having found it in 35 autopsies in deaths from other causes. The question of recognition and diagnosis previous to rupture, when the opportunity for investigation presents itself, is a leading one and is practicable in a majority of cases. There are a number of instances recorded of recurring tubal pregnancy, and while such may be expected in a considerable proportion of pregnancies that occur subsequent to a tubal pregnancy, I do not believe we are justified in removing the remaining and apparently normal tube and ovary at the primary operation.

The sixth and last class, that of myomectomy for uterine fibroids, I have operated upon two cases. The first, a woman aged thirty-two years, married and sterile, gave a history of severe backache, a sense of weight in the pelvis and a frequent desire to urinate; menstruation regular. Upon examination the uterus was retroflexed, somewhat prolapsed and enlarged to the size of a large orange, the posterior portion being especially developed. A diagnosis of fibroid was made and operation advised and accepted. Abdominal section showed a fibroma the size of a lemon, subperitoneal, having a broad base and springing from the posterior wall of the uterus. Here then was a typical case for the comparatively new operation of myomectomy, of which I took advantage. I made a free perpendicular incision in the posterior wall of the uterus through the peritoneum and the capsule of the fibroid and enucleated or rather shelled out the latter, hemorrhage was controlled by a rubber ligature around the cervix, and a portion of the excess peritoneal tissue was then excised in order that the line of suture, which included a portion of uterine tissue, would coapt the peritoneal edges more closely; medium-sized catgut was the suture material used. Patient made an uneventful recovery.

The second patient upon whom I performed a myomectomy for fibroid had not yet passed the climacteric; she had borne two children and for five months previous to operation had irregular hemorrhages; examination detected a fibroid the size of a large walnut in the anterior wall of the uterus. Upon abdominal section I found that its removal was equally feasible as in the preceding case, and, therefore proceeded to do a myomectomy; being on the anterior wall and thus more readily reached, its removal was not as difficult as the case just referred to.

The operation of myomectomy or fibroid enucleation, whenever possible, should take the place of amputation or total extirpation of the uterus. It is the operation of election in all single and multiple subserous tumors with well-defined borders; but the question can be decided usually only after opening the abdomen.

While the causes of fibroma are as obscure as those of tumors in general, yet from the present state of our knowledge of fibroid development and the pathological changes which take place in such tumors, and the frequently accompanying chronic invalidism or fatal termination, I am convinced that these should warrant surgical interference independent of any absence of symptoms of either pain or hemorrhage. Furthermore, the mortality of a do-nothing treatment is over 30 per cent., as compared with 5 per cent.

through surgical interference by skilled operators, as shown by tables given by Martin, of Berlin, and Noble, of Philadelphia

It has been my good fortune in my abdominal work for many years past, never to have met with an instance of secondary hemorrhage. I have never departed from silk as a ligature, the size of the silk used depending upon the size and thickness of the pedicle; I always make positive that my ligatures are both well-placed and always reinforced. Catgut has always seemed to me treacherous, the main difficulty being in tying it firmly so as not to slip and also its liability to fray.

The best means of prevention of abdominal or ventral hernia are small incisions and accurate coaptation of the various layers of tissue, thus securing firm apposition. In layer or tier suturing, desirable in patients with considerable adipose tissue, catgut and kangaroo tendon, in my opinion, are preferable and meet the indications best, being absorbable.

A point which I desire to emphasize is needless delay in operating as a factor leading to increased mortality. The diagnosis having been made and the necessity for operation having been determined, it is well to obtain the patient's immediate consent thereto and thus avoid the mental worry and excitement postponement may cause the patient.

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## THE EFFECT OF ERYSIPELAS UPON ATROPHIC RHINITIS; WITH REPORT OF CASE.*

BY LEWIS S. SOMERS, M.D.,
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WHILE the report of a single case of any disease which has been benefited by measures somewhat foreign to those usually found of value, can in itself prove of little service, yet isolated facts present possibilities for future studies on a larger scale and, therefore, the case which forms the subject of this report seems suggestive in the light of the present trend of serotherapeusis.

Atrophic rhinitis accompanied with ozena and not dependent upon disease of the accessory sinuses, implies by the very nature of its pathology, a condition which of necessity is not susceptible to complete structural restoration and it also implies not only the avoidance of the individual so affected by those with whom he comes into contact, but the constant attention to the nasal passages with all the difficulties encountered in the removal of the tenacious and partially dried secretions. While cases of this affection have from time to time been reported as being cured by various local measures, such results are but partial and do not apply to the restoration of the atrophied turbinal tissue, but rather to a clinical disappearance of the subjective symptoms and odor; which is satisfactory to the patient and from the nature of the case is practically all that can be expected.

As is well known there exists a certain antagonism between various diseases, the presence of one affection precluding for a time, at least, the development in the same individual of another, the immunity thus conferred existing for various periods of time; yet to a lesser extent and infrequently, the protective immunity of one disease over another is not only conferred upon the individual, but this power is more largely emphasized by the observation that in certain instances a pre-existing affection may be cured by the development of another disease in the same individual; erysipelas being the type of the disease at times presenting this therapeutic efficiency and the one which has been studied in this connection to the greatest extent, while advantage has been taken of the fact to use the products of the erysipelas organism in the combat against certain malignant changes. The following case is therefore presented because of its peculiar interest, inasmuch as it shows an apparent clinical cure of atrophic rhinitis in which ozena was prominent, and secondly, the manner in which this favorable termination was secured, that is by the influence of a severe attack of facial erysipelas.

W. S., male, aged thirty-eight years, had always been troubled with dryness of the nasal chambers and pharynx as long as he could remember, and especially since his tenth year. No history could be elicited of the usual diseases of childhood, he was abstemious in his habits, presented no evidences of syphilis and except for nasal catarrh in his mother and to some extent among the individuals of her family, the history was negative. His chief complaint was the presence of an intensely fetid nasal odor which at times became so marked as to be commented on by those associated with him, and which at such times prevented him from attending to social duties. In addition to this the nose and nasopharynx would become blocked at least once during the day and especially on arising in the morning, with large greenish crusts which were removed with difficulty and frequently attended with nausea and vomiting. Objectively, the nasal interior was roomy and filled with greenish crusts, emitting to a most marked extent the odor characteristic of ozena. On removal of the crusts the turbinals were pale, atrophic in great part, but the lower on both sides presented a few isolated spots of relatively normal tissue; the pharyngeal wall being visible through both nasal chambers. The nasopharynx was covered with masses of partially dry and offensive mucus, while the pharynx was red, dry and sclerotic. In other words, the case presented the usual picture of atrophic rhinitis without involvment of the sinuses, that is so frequently seen. He had received treatment both by others and myself, but except for the relief obtained by cleansing of the nasal chambers several times daily, other measures such as citric acid, oil of mustard, the tampon with iodine, etc., seemed to have but slight temporary effect, unlike the results usually obtained in the larger number of patients suffering with a similar condition.

On April 18, 1902, he received a slight blow

* Read before the North-Western Medical Society, April 7, 1903.

over the right eye, only sufficient to barely break the skin, and within twenty-four hours erysipelas developed over the bruised parts and rapidly involved the entire face and neck. The features became unrecognizable, abscesses developed on each of the upper and lower lids and a portion of the lateral cervical glands suppurated. The mucous membrane of the nasal interior was also involved, while the pharyngeal mucosa became dry and fissured. The attack of erysipelas ran the usual course, remaining localized to the head, face and nasal chambers, and the patient was free from all symptoms of the disease by May 5. A careful examination of the upper respiratory tract was made a few days later and it was found that the ozena had entirely disappeared, the nasal mucosa was in part covered with but few crusts and easily removed, while the necessity for the frequent removal of the inspissated secretions had entirely disappeared. The lower and middle turbinals on each side were still shrunken, but they presented a more healthy appearance inasmuch as small areas of mucous membrane more nearly approached the normal. The nasopharynx and pharynx still being in part crusted and dry, but in no degree comparable to their former condition. No treatment was advised except occasional cleansing with an alkaline solution, as it was desired, in view of the favorable results produced by the erysipelas, to observe if the changes were permanent in character. At the present time, the nasal mucosa remains somewhat shrunken and atrophic in patches over the turbinals, but is elsewhere apparently normal and the healthy areas are increasing in size; the secretions are practically normal and while there is occasional crusting, it produces no obstruction and absolutely no offensive odor is discernible. The upper pharynx shows in a marked manner the improvement, as it is no longer dry, fissured and covered with adherent secretions, but while the submucous tissue remains atrophied, the epithelium has been fairly well restored and except for a slight degree of dryness due to the diminished secretion, it no longer is the source of the previous annoyance.

Several centuries ago it was noticed that erysipelas would occasionally favorably influence, and in some individuals, cure various pathological changes, but until recent years no advantages were taken of this phenomena, other than it was considered a favorable influence for an individual suffering from some form of malignant growth for instance, to become the subject of an attack of erysipelas, as there was the possibility of the amelioration or cure of the pre-existing disease. At present, numerous investigations have been made upon this influence of erysipelas, and no doubt can exist but that the disease has a distinct influence upon certain affections, although this favorable effect is not constant and does not limit itself to any special class of pathologic changes. Syphilographers, especially, have at various times noted the disappearance of certain of the local manifestations of syphilis when the affected parts were coincidently involved in an erysipelatous infection and convincing evidence from clinical experience has shown that not only has the general course of syphilis been modified, but also that indolent and suppurating buboes, have been favorably influenced.

Of other diseases which erysipelas has ameliorated or cured, there are numerous authentic reports: Powlowsky has seen local anthrax cured under these circumstances; Hebra and others have described the permanent cure of lupus nodules; Terson saw a case of advanced leprosy of the conjunctiva ameliorated, the leprous nodules for a time disappeared entirely; while Hessler reported a case of epilepsy with from 40 to 70 attacks a month, attacked with facial erysipelas and after the acute infection had disappeared, the convulsions practically ceased. It cannot be doubted that erysipelas has caused the permanent disappearance of various cutaneous tumors, carcinoma of the mammary gland, tumors of the lymphatic glands and epitheliomata and, as stated by Coley, this curative action is an established fact and is more powerful in sarcoma than in carcinoma.

While numerous instances of the amelioration of various affections by erysipelas have been recorded, its effect upon atrophic rhinitis has not been observed; a careful search of the literature revealing but two cases, both reported by a single observer—Francesco—and of but recent origin. The first was that of a young girl, with ozena of seven years' duration, which had resisted all treatment. Erysipelas incidentally developed, originating at a point near the nostril and involved the face. After the attack had subsided, the odor and crusts entirely disappeared, the mucosa recovered its normal appearance, and as three years later there had been no relapse, the case undoubtedly could be considered as a complete cure. The second case was that of a young woman with ozena of the left nostril, which had resisted treatment. While nursing a brother with erysipelas of the leg, she developed the disease on the lobule of the left ear, and with the experience gained by the previous case, the author scarified the cheek near the ala nasi in order that the nasal chambers should become involved. The erysipelatous process then affected the entire cheek and nasal chambers, and when the patient recovered there remained no trace of the ozena.

Since Busch, in 1866, observed in a woman with multiple sarcomata, the development of erysipelas following his attempts to remove the growths, with their disappearance as the result of the infection, a new light was shed on the subject, and numerous attempts have since been made to relieve various affections by the inoculation with erysipelas, its prepared streptococci or its serum. In relation to its therapeutic efficiency, the most favorable results have been seen from accidental infection, while next in value is the culture and finally the toxins as experimentally isolated, are lowest in the scale of practical value. The best results in malignant tumors at least are obtained from erysipelas itself, but Emmerich found in animals that the serum had a

restraining influence on tubercular lesions of the eye, and he was able by its use to cure splenic fever and malignant pustule in rabbits.

Of the more striking features presented by this case, the disappearance of the clinical symptoms of the ozena as a direct result of the erysipelas and the efforts at regeneration which have progressed toward a favorable histologic change, seem worthy of careful attention. The latter phenomena showing itself most strikingly by the islets of normal mucosa increasing in size and by the increased vascularity of the nasal interior, with its more normal secretion.

A suggestive thought in this connection is that of the influence exerted upon one bacterium by another; it being well known that in laboratory cultures, the presence of one bacterium will in many instances prevent the growth of another, and in view of the presence of the *Bacillus mucosus* ozena in the nasal chambers in some cases of rhinitis, whether bearing an etiological relationship or not it is impossible at present to say, it may prove of some interest should the bacteriologist determine the degree of antagonism between this bacteria and the organism of erysipelas. While one could hardly suggest that ozena should be treated by streptococcus cultures as a routine measure, yet in a small class of cases in which treatment has failed to control the ozena and in which the patient is obliged to desist from active business or social relations on account of the nasal condition, it would seem that the injection of Coley's fluid, for instance, would possibly be productive of some material benefits. At all events it would seem desirable to note the effect of intercurrent attacks of erysipelas upon a pre-existing atrophic rhinitis, and the careful study of such cases from this aspect may possibly be the means of elucidating some of these complex problems.

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## ESOPHAGOSCOPY.*

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Laryngoscopy, oroscopy, cystoscopy and rectoscopy are all recognized aids for diagnostic purposes and it is my object to place the subject of esophagoscopy before you and claim a place for it alongside the above-mentioned clinical aids. If one takes up any book on clinical methods or diagnosis, he will find very little or no space given to this subject. Sahli, in his latest edition, says, "esophagoscopy, by means of the esophagoscope will be a very practical aid to diagnosis, but up to the present time the introduction of the instrument is too burdensome and too severe for the patient."

The idea of examining the esophagus by means of various instruments, originated with Störk in 1866, after laryngoscopy had been completely established. In 1868, Bevan described the use of an instrument for the examination of the esophagus. Waldenberg, in 1870, invented an instrument which came nearer to the modern one; for illumination a lamp, head-mirror and laryngeal-mirror were used. In 1880, MacKenzie began his examinations of the esophagus and in 1881, Mikulicz was the first to devise a long tubular instrument, the one end of which projected out of the oral cavity and thus did away with the use of the laryngeal mirror. He used a small electric lamp attached to a slender rod which ran along the inner side of the tube and illuminated the distant end. By the aid of this light, Mikulicz observed many interesting conditions, both in the normal and pathological esophagus. Leiter made improvements on the principle of the Mikulicz esophagoscope, and von Hacker then began to use it.

Since then, most esophagoscopes have been constructed on the ideas of the last mentioned authors, with but slight modifications. Some clinicians use the Casper electroscope for illumination purposes, that is, the illumination is kept at the upper or outer end of the esophagoscope. Störk modified the Mikulicz instrument by making a flexible end to it of jointed steel rings, which after introduction and with the patient in proper posture, resumes its straight position; there are, however, no advantages in its use. Kelling has also devised such an instrument, which in its entire length is made up of steel joints.

We now come to the modern instruments, from the more simple one of Rosenheim to the most recent one of Glücksmann. Rosenheim devised an instrument which differs slightly from that of von Hacker and that of Mikulicz. I will describe the Rosenheim instrument as follows: it is a smooth metallic tube, 11.5-13 mm. in diameter, and may be of any length between 22 and 50 cm. The distal end is slightly thickened and made dull, and to this end is fixed a soft rubber tip attached to a rod called the mandrin, introduced into the tube; this rubber tip makes the introduction of the instrument less dangerous. When the instrument has been completely introduced, the mandrin with the rubber tip is withdrawn and a Casper electroscope is attached to the outer end of the tube. The eye is placed to this end of the tube and by means of the electrical illumination, the esophagus in part, after sponging away whatever mucus or blood there may be present, is brought under immediate observation. The tube on its outer surface is marked off by a centimeter scale, which enables one to see how far he has entered the esophagus.

Einhorn also devised an esophagoscope with a miniature electric lamp at its lower end; this instrument he exhibited before the Medical Association of Greater New York in December, 1901. Schreiber invented a more complicated tube,

* Read before the American Medical Club of Berlin, Germany, Feb. 28, 1903.

which has a second much thinner tube attached, through which the mucus can be withdrawn and thus do away with sponging. Glücksmann, early this year, demonstrated an instrument on the Rosenheim principle, but which, in addition, had a rubber ring at its lower end that could be inflated from the upper part; this allowed a greater separation of the esophageal walls and thus afforded a larger field for observation. He has the lamp at the upper or outer end of the tube, objecting to the light at the lower end because if the lamp becomes covered with pus or blood the illumination is obscured.

The position of the patient is a very important consideration for the introduction of the instrument and each clinician has his favorite position and favorite instrument. Einhorn used his own instrument with the patient in the sitting posture; Störk, with the old instrument, always had the patient in the sitting posture; Mikulicz places his patients on the right or left side; von Hacker allows his patients the dorsal position; Boas, the sitting or horizontal posture, and Rosenheim always preferably uses the horizontal position.

Before introducing this instrument, the patient's general condition must be examined and all constricting clothes removed. If there are no contra-indications, such as I shall mention further on, to its introduction, then the whole posterior portion of the oral cavity is well anesthetized, with a 10- to 20-per-cent. cocaine solution or a 3-per-cent. eucaine solution; formerly, a hypodermic injection of morphine preceded the introduction of the instrument. Most clinicians precede the use of the esophagoscope by the introduction of a sound and Kraus lays especial emphasis on this point.

Mikulicz in his early work with the esophagoscope, described the esophagus as having three different motions, all visible by means of this instrument: Respiratory—during expiration an approximation of the walls and vice versa in inspiration; pulsatory—seen at the bifurcation of the trachea and extending downward, because of the close proximity to the heart; peristaltic, which is less frequently seen. The normal mucosa of the esophagus is very pale red in color and very smooth. Under pathological conditions, the surface alters its appearance and color and the vessel injection, especially in inflammatory conditions, is very easily recognized.

Although the instrument affords such advantages in diagnosis, its introduction in some cases is attended by some disadvantages, among which may be mentioned, (1) patients unable to open the mouth widely and the presence of the incisor teeth; (2) hypersecretion of mucus; (3) entrance of some secretion into the larynx, followed by cough; (4) vomiting; (5) diminished flexibility of the cervical vertebræ; (6) acutely convexed tracheal cartilages; (7) unrest of the patient.

The length of time necessary for the examination of a patient with the esophagoscope depends upon its effect on the patient and the local condition; in fact, an examination need never last more than three minutes, and, if necessary, may be repeated several times, always allowing a few days between each examination. It need hardly be necessary for me to say that the instrument should be immediately withdrawn in case there is a marked hemorrhage. It is hardly possible to make such an examination without assistance, as some one must support the head of the patient. Esophagoscopy is attended with but one serious danger and that is, perforation; this, fortunately, has been a very infrequent occurrence. The indications for esophagoscopy are: (1) To note the site and character of foreign objects within the esophagus; (2) to recognize local lesions, such as erosions, ulcers, etc.; (3) to note the character of an obstruction, if one is present; (4) to recognize new growths, benign or malignant; (5) to recognize a diverticulum, though this is not easy; (6) for differential diagnosis between organic and functional conditions of the esophagus; (7) last, but most important, for therapy, such as the extraction of foreign objects, local treatment of ulcers, erosions, etc.

Among contra-indications may be mentioned, nervous patients; debility; patients with short thick necks; marked emphysema and dyspnea; myocarditis and uncompensated heart lesions; aneurism and arteriosclerosis; kyphoscoliosis; liver cirrhosis with tendency to hemorrhages; acute inflammation of the esophagus.

When anyone for the first time is about to see an esophagoscopy performed, he always asks himself, Can such a barbarous looking instrument be easily passed and what is the effect on the patient? No matter what the posture of the patient is, whether sitting, on the side or horizontal or on the back, in every case the head is thrown as far backward as possible, which makes the esophagus more or less straight and favors the passage of the tube. The effect on the patient varies with the individual; some patients submit very quietly and suffer no very unpleasant results, and others struggle, become cyanotic, breathe laboriously, and require more or less moral anesthesia to quiet them. The after-effects may be some slight intrathoracic pain, which gradually and rapidly passes away. Many a patient will readily endure considerable inconvenience, pain and marked cyanosis if the foreign body be withdrawn from the esophagus through the tube; the physician, on the other hand, will feel more than gratified, when he notes the diminished respiratory motion of the esophagus wall, due to its infiltration, the presence of a little pale prominence with or without a bleeding point, that he has made diagnosis of carcinoma.

Esophagoscopy to-day is practised most frequently in Germany in but two clinics, at that of Mikulicz, in Breslau, and at that of Rosenheim, in Berlin, where I have had the opportunity of examining a large number of cases during the past months and to form an opinion as to the advantages of esophagoscopy. To get simply an idea of what really has been done by esophagoscopy, one need but read the excellent monograph of Gottstein on the subject.

It would not be quite fair for me to say that this method of examination has found universal satisfaction and while it has its ardent admirers, it also has others such as Ewald, Boas, and Kuttner, who hesitate longer in its employment for diagnosis and say the latter should be made without the instrument and without subjecting the patient to it; which, after all, are but insufficient arguments against its use. Kraus says, "Esophagoscopy without doubt is of great diagnostic value, more valuable perhaps in the hands of the surgeon because of its therapeutic indications." Mikulicz in the preface to Gottstein's monograph says, "The esophagoscope not only allowed us to view well-known clinical pictures better, but has directly brought before our eyes conditions which heretofore were unknown or but poorly recognized and falsely diagnosed. Up to the present time, the one control for a clinical diagnosis was the post-mortem examination but all cases do not come to autopsy and esophagoscopy offers another control."

Formerly a skeptic, I have been completely won over to the use of this instrument and there is no doubt in my mind, that the esophagoscope in the hands of a careful observer who knows how to correctly interpret what he sees, is a most valuable aid to diagnosis.

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## INDICATIONS AND COUNTER-INDICATIONS FOR PROSTATECTOMY.*

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Not long ago, the medical profession thought that in perineal prostatectomy, a radical method had been found for the cure of hypertrophy of the prostate; many operations were performed the world over, each operator recorded his cases, and medical newspapers were full of this literature. Now it seems that after the enthusiasm of the first moment, more reflection is exercised, and we do not hear of so many prostatectomies performed. Discrimination has been made. Experience has sanctioned operation in only those cases that give assurances of a probable good result. To facilitate the selection of these operable cases, the writer of this paper submits to you what he considers the indications and counter-indications for prostatectomy.

In the pathogeny of the accidents of prostatism, many factors come into play. In stating that the hypertrophied prostate plays the most important rôle, I must submit that there are individuals who have for many years a very large prostate without being troubled. Notwithstanding this contradictory fact, the prostate is often the first pathological factor. Under the influence of its hypertrophy, the bladder is disturbed in its function, the urine does not flow through the urethra with the same freedom, and then begins the vesical evolution of perturbation, which is first acute, then intermittent, then chronic retention. Vesical contractility will become weaker from day to day and at the end of a period, varying generally from eight to ten years, the patient will arrive at the condition of complete and definite retention. At that time the catheter life and its attendant miseries begins and ultimately conduces to the death of the patient. During all this time the necessity of catheterization exposes the patient to the accidents of infection.

Prostatism is made of all these combined, associated and blended elements, and when the responsibility of treatment has to be assumed for a prostatic patient, it is necessary to make a complete examination and to establish a precise diagnosis. The observations must be related in detail, the group of symptoms disassociated, the succession of accidents established, and those relating to each organ carefully analyzed. Without these precautions, there is risk of performing an unjustifiable and useless operation, or, at all events, of failing to obtain the hoped-for result.

To make a complete diagnosis of prostatism, it is necessary to analyze the individual, the apparatus, and the organ. Concerning the individual, that is, the heart, the lungs, the arteries, etc., there is here nothing special to be said. As to the urinary apparatus, the kidneys above all are to be examined. The polyuria, the turbid urines, the great deposits, the vague symptoms of Brightism, all the signs of these should be searched. They have a great prognostic value, but their research does not offer any special particularity. With the prostatic, it is the examination of the organ that most interests us, and by organ, I mean the prostate and the bladder. It is to that examination that we must bring great precision, because upon it depends the selection of the operation to be performed.

For the examination of the prostate, many means of unequal value can be utilized. First, the rectal touch: it must be made with an empty bladder, otherwise the prostates, spread by the vesical extension, all appear increased in size.

* Read before the California State Medical Society, April, 1903.

The rectal finger shows the volume of the prostate, its length, its width, its firmness, its consistency. Notwithstanding that these informations are very vague: there are some prostates with rectal evolution that are not large. They are felt by the rectal touch. There are others with vesical evolution that are large and are not felt by the rectal touch. Besides, the rectal touch does not give sufficient information concerning the volume of the prostate. It is only an indication, but, if we combine the abdominal palpation with the rectal touch, it will be easy to gain the conception of an interposed volume, more or less great, depending upon the size of the prostate. Each lobe is to be palpated successively and its relative volume appreciated. However, this is possible only with lean individuals; with corpulent prostatics whom we frequently see, we must employ other methods.

It is then that catheterization intervenes to give us information of the highest precision. The olivary explorator and the bi-coudee sound give us positive data on the volume of the prostate. They make us know the existence of a greater or less prominence on the posterior wall: they show sometimes by the stop they undergo at this level that there is a cul-de-sac of depression with a bar above, but over all they show, by the depth to which they penetrate what is the length of the prostate, and the length of the prostate is in direct ratio to its volume: the more it increases, the more it lengthens. Its superior face is pushed toward the abdomen by the hypertrophy, and the length of the prostatic urethra, which in the normal state is 27 millimeters, reaches a length of 4, 5, 6, and even 7 centimeters. Consequently, to draw the urine off, the sound must penetrate that depth, and an experienced eye can judge of the volume of the prostate by the depth to which the sound has to penetrate.

The metallic explorator confirms these data in two ways: by the depth it attains, it shows the length of the prostatic urethra and besides, by lowering the handle, the elevation of the neck of the bladder is ascertained. The more voluminous the prostate the more will the neck of the bladder be elevated. This is a general law from which the prostate cannot escape. Placed at the inferior part of the pelvic cavity, the prostate cannot enlarge downwards on account of the ischio-pubic rami. Upwards, on the contrary, and there only, it is free. Hence, when the hypertrophy takes place, the prostate rises more or less towards the umbilicus and carries with it the vesical neck, consequently the vesical neck will be pushed upward directly as the prostate is enlarged. But, when the neck of the bladder rises, the bas-fond becomes depressed and the depression of the bas-fond is in proportion to the degree of the hypertrophy. Now, then, this depth of the bas-fond will be shown to us by the metallic explorator.

When the metallic explorator is introduced, if with it you can execute a complete circle of the neck it is because the prostatic pouch exists. In addition to this, by exploring to the right and to the left of the neck, you determine to what extent the right and left lobes of the prostate project into the bladder and, owing to a median obstacle, you can discover the existence of a senile or pedunculated lobe. Thus a series of precious notes are furnished by the intervention of only an instrument commonly used in the search for vesical calculi.

We have another means of determining the intravesical projection of the prostate, *i.e.*, cystoscopy. The cystoscope confirms the data established by the means I have already mentioned. Depth of the bas-fond, median or lateral projections, these conditions are again demonstrated by the cystoscope.

These are the means that permit us to define the exact state of the hypertrophied prostate. Before making a decision, it is necessary to know and appreciate the condition of the vesical muscle. The study of the urinary residuum gives us the nature of its contractility. When the bladder empties itself completely, it is because its contractility is intact; when it empties itself partially, it is because it is already in a state of inefficiency; but when it does not empty itself at all, when the retention is complete, it must not be concluded that the contractility is completely lost: on the contrary, even in these cases, it is rare that the vesical contractility is entirely abolished. It appears that even in complete and chronic retention, the vesical muscle aided by the catheter, has more vitality than in the chronic and incomplete retentions where the patient, neglectful of the catheter, aids less willingly the contractility of the vesical muscle. When the bladder is filled with water and the catheter remains in place, we can judge of the vesical contractility by the intensity of the stream of the liquid column. A manometer is not necessary, as this simple exploration is sufficient. When all these facts are known, it is possible, I think, to weigh with certainty the indications and contra-indications for the treatment.

The indications for prostatectomy are based upon conditions that vary according as the patient labors under the first, second, or third period of prostatism.

In the first period, when only dysuria and nocturnal frequency exist, prostatectomy ought to be postponed. At that time the operation would be somewhat extreme, and I do not see any trouble that may arise by waiting until the period of more serious complications. I see, on the contrary, the advantages of this prudent expectation. But when we find acute retention, which is the first indication of the failure of the vesical muscle, then the question of the operation presents itself again, and this time the operation appears to me to be perfectly indicated if the prostate is large. With a large prostate, congestive attacks will surely return, the retention that has begun will be more pronounced. If it be true that all methods for relief have, in this condition, given extraordinary success, perineal prostatectomy can-

not be inferior to any. The operation reaches the obstacle, which is the prostate; it alone removes that compression made by the lateral lobes upon the lumen of the urethra. Consequently the bladder, freed from this initial primary obstacle, has no more reason to be subsequently disturbed nor its muscular function further weakened. Results will some day show that the patients who have been a long time under observation and subjected to operation at this initial period, have been definitely cured. But, if I reason thus for a large prostate, I will be more circumspect regarding a gland of small volume. Notwithstanding the acute accidents, if the prostate is small, we can wait, and I believe it is better to await under a prudent and vigilant supervision, the manifestation of more serious difficulties.

When the patient has arrived, after a more or less prolonged period of miseries, at the stage of chronic and complete retention, prostatectomy will almost always be indicated. It is then that it will give its best results. Although the vesical contractility appears lessened and even abolished, and although the patient is unable to expel even a few drops of urine, the prostatectomy, by removing the obstacle will permit these patients to urinate spontaneously and sometimes even to empty their bladders. In these cases the obstacle whether it be large or small is the important causative element. If the indication for prostatectomy is indisputable at this period for a large prostate, it is equally so for a small prostate if vesical sclerosis has not been known to be the primary factor in the process. The diagnosis of these cases is, moreover, very difficult to make; and I believe that the doubt ought to be on the side of the operation. I may say willingly that at this stage the operation meets only counter-indications which further on I will mention.

At last the patient reaches the period of incomplete and chronic retention. He has a residue of three to six ounces; he uses the catheter two or three times every twenty-four hours. Should we operate under these conditions? Yes, if the prostate is large. The operation is justifiable because there is chance of improvement, but we must be wisely conservative, because it is these bladders, sclerosed by cystitis, and whose diminished power is imperfectly supplemented by the catheter, that furnish the majority of failures in prostatectomy. Before the operation, the residue was three ounces—it remains the same after. Before the operation the catheter was used three times a day—after, it is necessary to use it the same number of times. The patient has lost his prostate and his condition has not been improved. On these patients I consider the indication of an operation only when there is a large prostate. I attach a great importance to the volume because with the marked enlargement we have the best chance to obtain a good result.

Another indication for prostatectomy in these patients is shown by the presence of calculi which notwithstanding previous lithotrities, continue to recur with the same disheartening persistence. With these patients the prostate is the indirect cause of the relapse. That organ, by elevating the neck of the bladder, forces the depression of the bas-fond and induces calculi to lodge there: that organ, by forcing the retention invites the agglutination of the infected residue, and the formation of calculous concretions. Hence, instead of crushing through the urethra, a calculus where the conditions of production are not modified, I think it more surgical to reach the bladder by the new perineal operation, to remove the prostate and afterwards the foreign body, thus at the same time disposing of the calculus and the condition determining its formation.

But prostatectomy has also its counter-indications, and it is not a paradox to say that, in determining the course of treatment, counter-indications more than indications have to be borne in mind. The consideration of a slight operation on an aged, fatigued person, with all his organs and apparatus impaired, may find in the state of the individual, elements of the highest gravity. Age constitutes the first counter-indication. Beyond seventy-two years, chances of success of operation diminish considerably, and as prolonged life cannot be expected at that age, benefits of the operation are proportionately decreased.

Infection is another factor that pleads against the operation. Here, however, we have to understand each other. The infection is more or less constant with the prostatic, but it can be vesical and remain chronic. But, when it is accompanied by acute congestion and fever, and at the same time there exist chronic lesions of sclerosis and renal infection, the operation presents dangers that ought to defer it to another epoch, and oftentimes postpone it indefinitely.

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## MORAL INSANITY OR DEGENERACY.

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It is agreed among modern writers and observers along psychological and neurological lines that there exists in mankind marked mental disorder with great moral disturbance, yet with the intellect fairly developed and often unaffected or brilliant.

The description of this form of degeneracy is given thus: "A person, who may be educated, cultivated, have a good memory, do many kinds of work well, may even be a genius, but is strongly emotional, unstable, lacking in judgment and reason. Precocity or disequilibration being often marked in some of these patients, the phenomenal mimics, mathematicians and child pianists often come under this heading. In others, the ethical feelings are changed: they lack self-control, giving way to sprees, immorality and other excesses.

and we hear of them periodically taking the gold-cure or recruiting in sanitariums and other health resorts. Often the animal propensities override the intellectual power, as eroticism and sexual perverts, they step mentally and morally over the border line of recognized decency and sanity and then they pass to the criminal or imbecile class, to which they are closely allied. Examples of this type are brought to our notice constantly, either in our professional, business or social relations, or through the daily press.

It is encouraging that these degenerates are being more and more recognized and studied and will receive greater consideration and sympathy as time goes on, and the general public becomes enlightened through our instrumentality, as students and observers, and as our conclusions are given to scientific bodies, to clubs, to the press, and on the witness stand, where we are liable to find ourselves at any time, endeavoring to protect the degenerate from the punishment which should be meted out only to the criminal. This latter class should be looked at from the standpoint of its nervous organization, as usually unstable, and quite prone to develop suddenly mental diseases. In some of these cases anatomical stigmata are well marked, viz.: the ill-shapen and prominent ears, cranial deformity or asymmetry, lanky figure, gothic or flat, broad palative arch, widely separated and irregular teeth; anomalies of the skin, genitalia, etc. In others, the physiological stigmata may be present, consisting of anomalies of the motor and sensory functions of speech, appetite, motion, gait and sexual derangement. Nutritive and circulatory disturbances are frequently observed, also vasomotor symptoms. The psychic disturbances of degeneracy consist of insanity, idiocy, imbecility, neurasthenia, prostitutions, the criminal class, hysterias, epileptics, feeble-mindedness, precocity, eccentricity, moral delinquency sexual perversion and those with poverty of ideas. These people have little self-control over their emotions; they are lacking in reason and judgment and are so sensitive and suspicious that they cannot adapt themselves to their families or employers, their circumstances or surroundings. They are erratic, impulsive, easily moved to tears, fearless or timid, and eccentric, but especially are they lacking in mental balance, that quality which man must possess to a great degree to make a success in life, and to go safely through its trials and vicissitudes. When young and protected by their family or guardians, many of these patients exhibit only a deficiency in moral sense. They may be capable of receiving an education, culture or acquiring a trade; but with the strain and trials of later life their moral nature shows its weakness, if not a state of depravity. Their emotions may become depressed or exalted and they become so agitated that they commit suicide or homicide, their emotional explosions, like those of epilepsy, often bring relief, and they relapse into their normal condition.

Dana says about two per cent. of normal men have the stigmata of degeneration, but man is not considered a degenerate unless several of these deformities are manifest.

According to law they are conscious of right and wrong, and thus they are held legally responsible. Medical men, who study these degenerates, recognize their inability to control their strongly perverted emotions, or the temporary manias or melancholias, which are easily developed in such neurotic soil. These patients are accomplices or perpetrators of sin and crime, but they should be understood and dealt with from their proper standpoint, and they and their families saved from the disgrace which so often befalls them. They may have been considered odd or eccentric, but not until they have committed some criminal or immoral act, or present symptoms of acutely ingrafted insanity, do their friends think of their having always been a little insane, especially at periods, resulting from various exciting causes, as grief, worry, insomnia, excesses, illnesses, or physical debility. The patient then comes under our care and study and we recognize a degenerative psychosis with a latent acute insanity. These cases of degeneracy vary greatly, presenting every shade or mental blemish from morbid ideas, manners and customs to the criminal class and idiocy. But the variety which I wish especially to dwell upon is the one often met with and which frequently puzzles mankind. The one which can be managed with the greatest difficulty and which receives the greatest injustice.

A man of this class was recently tried in the Onondaga County Court for murder. As a child, we learn, he was bright and enjoyed study, but was shy, fond of being along, reading 'way into the night, sleeping but little, was self-willed, uncontrollable, and having constant altercations with his teachers and family. At eighteen years of age he became melancholic and attempted suicide, but failed in the attempt. For the next eighteen years he lived in thirty-six cities, in Europe and America, working for a large number of employers; in fact, constantly vacillating from place to place and from city to city. Few of his reasons for these frequent changes being sufficient, according to the opinion of a man of average thrift, reason and judgment. During this latter period of eighteen years he has twice attempted suicide, while having recurrent attacks of depression. The history of his manners, customs, habits and ideas, as elicited from himself, his relations, his fellow-workmen and employers, shows he was erratic, quick-tempered, easily influenced, unstable, sensitive and suspicious; he entertained socialistic views of life and considered suicide right, if one were unhappy or made a failure in life. He has a good memory and is fond of our best literature; in fact, is educated and intelligent in many ways beyond the average workman. Another peculiarity is that he should fit himself for such a position as a dyer and cleaner of clothing, when educational advantages were offered and urged upon him, and his family were educated people who held and still do hold good social and busi-

ness positions and relations. These tendencies all suggest a perverted, unbalanced and unstable mental condition. Heredity is a potent factor in this class of cases, the family taint being of course greater the larger the number of ancestors and relations afflicted with nervous and mental diseases, as the various neuroses, epilepsy, consanguinity, alcoholism, drug habits, and the various insanities. Such an inheritance is bound to afflict some of its posterity or relations with degeneracy, if nothing more serious. The man referred to comes from a family of neurotics. His mother is eccentric, his sister a paranoiac, an aunt is a meloncholiac, and an uncle and cousin both suicided while suffering from the latter disease. Another cousin is a feeble-minded epileptic. His other brothers and sisters are thus far free from mental disease, while he, poor fellow, has been a "ne'er do well" throughout his life and will continue in this condition, as it is incurable, unless he drifts into some more serious mental disease, which very often develops from this primary condition of degeneracy.

It is important that this condition be recognized in early childhood, and early training, discipline and example exert a beneficial influence. The precocious child should not have especial attention given to his one-sided talent. He should be developed along the line of his *general* ability. Especially should all young children who are self-willed be taught obedience and to think before they act. These points are as necessary to their success in all departments of life, business or social, as the culture, education and business training which we parents and educators are so desirous they shall obtain. Self-poise and self-control are of great advantage throughout life, and very much of this must be cultivated and developed in the home, and especially is this training due to the child who shows a nervous, excitable temperament or one who comes from neurotic ancestry.

My closing wish and thought is that we study more and more these degenerates, educate the public regarding them, and then protect ourselves from their uncertain, emotional movements, and endeavor to protect these unfortunates themselves from the special trials which so easily cause them to lose mental equilibrium, when they are liable to commit some rash deed for which they are not mentally accountable, but for which our laws hold them responsible, unless they show other evidences of insanity which are so marked that a layman can easily recognize them. Then, if they escape the criminal's chair, they only escape to go to the hospital for the criminally insane. Is it not our duty as physicians and observers to educate mankind in general regarding the dangers and expectations from heredity and the lack of self-control throughout life?

The degenerate must be considered solely upon the mental, moral and physical stigmata which brand him as an abnormal or atypical man, and prevent him from exerting himself to the highest limit commensurate with his skill and development.

# MEDICAL PROGRESS.

## MEDICINE.

**Meningitis Without Anatomical Lesion.**—It sometimes happens that patients die very acutely with all the symptoms of a severe meningitis and yet only a slight exudate and perhaps a moderate degree of swelling and hyperemia of the brain is found post mortem to account for the condition. The case of Birnbaum (Münch. med. Woch., July 21, 1903) is peculiar, however, in that the patient was ill for fifteen weeks and that absolutely nothing was found post mortem in the meninges. Bacteriological examination, however, revealed the presence of meningococcus, and the cerebrospinal fluid withdrawn during life showed a slight coagulum, which always is suspicious. The case must therefore be looked upon as one of meningeal sepsis without anatomical lesion. The cause was probably a gum-boil which had been incised with extraction of the diseased tooth, two days before the acute onset of the illness.

**Sepsis Caused by the Diphtheria Bacillus.**—Diphtheria is a disease which leads to intoxication rather than to infection and there are only one or two cases on record where the germ was really found circulating in the blood. The case of Roosen-Runge (Münch. med. Woch., July 21, 1903) is of exceptional interest since the patient originally suffered from another disease. He came to the hospital with a consolidation on one side followed by an empyema in which pneumococci occurred in pure culture. After resection of a rib, the temperature dropped and the patient seemed to be convalescing, until six days after the operation, when the exudate became hemorrhagic in character and fluid appeared on the opposite side with renewed rise of temperature. The course of the disease was now steadily downward, with high fever and dyspnea. The bacilli grown from the blood had all the characters of diphtheria bacilli except that they were not pathogenic to animals. This does not, however, prevent the author from pronouncing the case as one of diphtheria sepsis, probably taking its origin from the wound in the pleura.

**General Sepsis Caused by the Pneumobacillus.**—A patient apparently suffering from sepsis with marked involvement of the lung was observed by F. Jenssen (Münch. med. Woch., July 21, 1903.) Other prominent symptoms were an enlarged and tender spleen, albuminuria, very rapid pulse and remittent temperature with only a single chill. From ten cubic centimeters of blood taken from the cephalic vein, abundant growths of the Friedländer bacillus were obtained. The patient died after a week and at autopsy there were found pleuritis, multiple foci of consolidation in both lungs, abscess in the kidneys, abscess of the liver perforating into the free peritoneum, diffuse purulent peritonitis, splenic tumor and cloudy swelling of the heart, liver and kidney. The portal of entry could not be ascertained, the infection might have taken place from the lungs or tonsils though the patient's history seems to point to a gastro-intestinal origin. The Friedländer bacillus has been found in purulent inflammations of almost all organs of the body, yet cases of general infection are rare and reports on positive blood-cultures are still more infrequent in literature.

## SURGERY.

**A New Incision for Resection of the Appendix.**—The new incision of E. Beer (Centralbl. f. Chirurg., July 25, 1903) is a modification of the one recommended by Gerster, and does not injure the posterior sheath of the rectus. The skin is incised directly above a line which connects the navel with the middle of Poupart's ligament, about 1 to 2 centimeters mesially from the

outer edge of the right rectus; in length the incision should not be more than 3 to 4 centimeters. The rectus is then pushed inward, when the semilunar fold of Douglas and the inferior epigastric artery come to view. Now the peritoneal cavity is opened directly beneath the semilunar fold and external to the inferior epigastric artery. The risk of a subsequent hernia is thus reduced to a minimum. Should the opening prove too small, it is still possible to open the posterior sheath of the rectus. The peritoneum is finally closed by means of a continuous catgut suture, the anterior sheath with chromicized catgut or silk, and the skin with silk or adhesive plaster.

## NEUROLOGY.

**The Pathogenesis of Acute Psychoses.**—This has long remained one of the unsolved problems of psychiatry and none of the numerous theories advanced have stood the test of experimental trials. The view which has lately met with the most support is that these phenomena depend on delicate chemical changes in the cortical cells, which occur without the production of any morphological alterations in the cells themselves. In this way the theory of a circulating toxin in the blood has gradually gained credence. Experimental proof of this theory has been sought by H. Berger (Berlin. klin. Woch., July 27, 1903). The first of these trials were performed by the author on himself. He injected at intervals serum, blood and cerebrospinal fluid from a patient suffering from acute dementia with hallucinations, without the least effect. This seems to show that the toxin, if present, must already be firmly united with the cerebral cells before the acute symptoms appear. In the belief that the toxin may have been found during the prodromal stage, the author also injected subcutaneously blood from a patient who was developing symptoms during her puerperium, which later turned out to be a dementia precox. No effect was seen, but blood taken from the same patient four weeks later, during a fresh attack, and injected, was shortly followed by vertigo, and later by cardiac palpitation, cerebral pressure, and a marked feeling of fear. All these symtoms subsided on the following day. A similar experiment with the blood taken from a more advanced case in a condition of stupor at the time, was also followed by results which were much more marked and severe and did not subside for a week. The experiments were then continued on animals and a basis secured for further investigation in regard to the changes which specific toxins contained in the circulating blood may cause in the central nervous system. The details are not suitable for a brief abstract. They consist mainly of observations made with the serum secured from the goat which had been made neurotoxic for dogs, by the continued subcutaneous injection of triturated cerebrum from the brains of dogs. Intracerebral injections of this goat serum in dogs was followed by well-marked pathological changes in the pyramidal cells of the cerebral cortex and later on a large aggregation of leucocytes around these degenerated cells. Similar pathological conditions have been found in patients afflicted with acute psychoses and also in other cerebral diseases, but the author is not as yet prepared to draw final conclusions until further proof has been secured.

## PHYSIOLOGY.

**Rapidity of Growth and Length of Life.**—That the span of life of the mammalia is related to the rapidity of growth, was first pointed out by Buffon and later by Flourens, according to G. v. Bunge (Pflüger's Archiv, Vol. 95, Nos. 11 and 12). They expressed this relationship in a numerical ration, Flourens finding this to be 5, although Buffon thought it was 6 or 7. That is, the number of years it takes to reach adult life, multiplied by 5 would give the duration of life. These observers found the age of maximum growth to be the period at which the epiphyses and diaphyses of the long bones unite. The author, in the course of an investigation on the relationship between the composition of milk and rapidity of growths in the various mammalia, had the opportunity of determining the time it takes the animal to double its birth-weight. The results were tabulated in a series as follows, the numbers referring to days: man, 180; horse, 60; ox, 47; sheep, 15; hog, 14; cat, 9½; dog, 9. This order is exactly the same as that given by Flourens for the period of attaining maturity, tabulated in years, as follows: man, 20; horse, 5; ox, 4; sheep, —; hog, —; cat, 1½; dog, 2. The average duration of life, as given by this author, in years, is as follows: man, 90 to 100; horse, 25; ox, 15 to 20; sheep, —; hog, —; cat, 9 to 10; dog, 10 to 12. From the last two series it appears that the factor 5 of Flourens is not exactly correct. In the determination of the average duration of life there must of course be excluded all these cases in which life is cut short or shortened by accident or disease. To the author it appears that there must be some other functional relationship between the two variables, length of life and period of growth, than the mere numerical relationship, and that even this numerical law might be deduced from some other more general law. At any rate the author is convinced that there is a law of relationship between period of growth and length of life and that the exact determination of this law would be of eminent interest.

**The Coagulability of the Blood of Asphyxia.**—Carbon dioxide does not exert in vitro, according to M. Carrara (Archives Italiennes de Biologie, June 10, 1903), any anticoagulating action upon the blood of asphyxiated rabbits or dogs, but seems to favor coagulation. In fact the blood of such animals coagulates in the test-tube more rapidly than normal blood, which phenomenon is all the more marked the longer the asphyxia has lasted. This accelerated coagulability is to be attributed to the large amount of Ca-ion rendered active by the very conditions of asphyxia (formation of bicarbonates). The osmotic pressure of the blood increases during this condition: but slightly, when it is caused by the sudden or gradual occlusion of the trachea, and markedly when it is produced by $CO_2$ and respiration in confined air.

## HISTOLOGY, PATHOLOGY AND BACTERIOLOGY.

**Pathology of Beginning Prostatic Hypertrophy.**—Considerable confusion reigns as to the real pathological changes which underlie hypertrophy of the prostate. In order to observe these in their incipiency, A. Rothschild (Virchow's Archiv, Vol. 173, No. 1) carefully sectioned thirty glands from patients thirty to fifty years old, not suffering from acute infections or constitutional disease or of inflammatory affection of the genito-urinary tract. He found the following changes: (1) Glandular tissue. The glands were dilated and their walls less convoluted. Pathological contents—chiefly pus cells and desquamated epithelial cells, with detritus and amylaceous bodies—were found in nearly all and where the lumen was filled, the epithelial lining was converted into a single layer of cubical or flat cells. (2) Connective tissue. Foci of small, round cells in a process of cell division were frequently encountered in the stroma; their number and location varied considerably, but they were rather frequently found encircling a pathologically altered gland. The blood-vessels and muscle-fibers did not participate in the changes. The lesions of prostatic hypertrophy must thus be classified under chronic inflammation. It is probable that the newly-formed connective tissue com-

presses the gland, but still more so their excretory ducts, so that a stasis and secondary dilation takes place, to which the greater part of the increase in size must be attributed.

**Pupillary Changes after Death.**—The development of rigor mortis follows a certain definite law. Three to six hours after death it affects the neck muscles and then descends to the trunk, arms and legs. After three to four days it disappears in the same order. The heart is involved somewhat earlier than the other muscles. Observations on smooth muscle-fibers are very scant, so that A. Placzek (Virchow's Archiv, Vol. 173, No. 1) made a systematic study of the size of the pupils at various times after death to ascertain if the muscles of the iris follow the general law. Cats were selected, since their prominent iris permits of very accurate measurement. In the first two hours after death, the pupils begin to contract; this goes on until, after six to twenty-four hours, only a narrow slit remains. After twenty-four to forty-eight hours relaxation is again complete and no further excursions are then noticed. There may be individual variations; thus the process need not be synchronous on both eyes of the same animal; the secondary dilatation may be interrupted for a short time by a secondary contraction or the secondary dilatation need not occur at all. The pupil varies much in shape when completely contracted: it frequently is very irregular in outline. In man, rigor mortis of the iris begins in the second half of the day of death or in the first half of the following day, hence is independent of the contractions of the skeletal muscles. Differences on both eyes are also observed very frequently. To explain the contraction it must be assumed that the tonus of the dilator pupillæ is lost much sooner than that of the constrictor pupillæ. The author then examined a number of pupils that were altered in size by drugs shortly before death. Eserin injected subcutaneously was followed by miosis; shortly before death the pupils dilated and after death behaved as stated above. Applied locally there was contraction followed by maximum dilatation in the death agony; the post-mortal changes were the same as before. Exactly the same phenomena were observed after morphine injections and after division of the sympathetic nerve. The post-mortal variations in size were not affected by mydriatics instilled before death any more than by miotics; the pupils did not dilate until just before death and then contracted and dilated as before. When a drug which acts directly upon the muscles of the iris (adrenalin) was employed, the dilatation persisted much longer after death and was followed by only a slight contraction.

**The Relation of Blood Sera to Strychnine Poisoning.**—The success which has attended the efforts to immunize individuals with respect to certain pathogenic agents, has, according to D. Lo Monaco (Archives Italiennes de Biologie, June 10, 1903), inspired many investigators to discover methods of immunizing animals against not only organic but also inorganic poisons. These researches take their point of departure from two facts, namely: the pharmacological experience that all organisms do not react with the same intensity toward certain toxic agents, certain animals having a natural immunity toward particular poisons; and the possibility that animals are capable of acquiring toleration for otherwise deadly quantities of alkaloids or metallic salts, *e.g.*, arsenic eaters, opium fiends, etc. Ehrlich, by the gradually increased and prolonged administration of abrin (a deadly poison contained in jequirity) and ricin, succeeded in immunizing animals against otherwise fatal doses of these poisons, and demonstrated, moreover, that the serum of these animals, when injected into others, transmitted to them this same immunity. Rummo was able to habituate guinea pigs to very large doses of strychnine, and found that the animals thus treated possessed a marked resistance to infection with otherwise fatal cultures of tetanus bacilli. Both Giacosa and Robecchi obtained negative results in the effort to fortify against fatal doses of strychnine, rats, rabbits and guinea-pigs, by means of injections of the blood serum of the hen, an animal strongly tolerant to this drug. Although curare, ether, chloroform, chloral, paraldehyde, the bromides, etc., have been used in strychnine poisoning, none of these drugs can be recognized as an antidote. It is of peculiar interest that Lusini was able to protect rabbits against the minimum fatal doses of strychnine (.6 mg. per kg.) by means of injections of antitetanic serum, administerd before or after the injection of the toxic dose. Centanni and Bruschettini obtained the same results with polyvaccin. The author, inspired by the success of the above investigators, conducted a research with the object of determining whether rabbits may be partially immunized against strychnine poisoning by means of single or repeated injections of the blood sera of herbivorous animals, themselves not specially tolerant of strychnine. He was successful. The blood serum of the horse, and to a more uniform degree, that of the cow, after four or five injections into the rabbit enables this animal to tolerate the minimum fatal dose. The convulsive stage occurs, but it apppears late, is short and is not followed by marked exhaustion. If the prophylactic treatment is continued for about twelve days, the resistance to poisoning becomes more marked. By using the blood of the immunized rabbit and injecting its serum into another rabbit on successive days, the author was able, although in only one instance, to transfer this immunity. He also succeeded in augmenting the resistance of rabbits to strychnine by means of repeated doses of the antitoxins of tetanus, bubonic plague, and, best of all, of diphtheria. He believes that the natural resistance of an animal to this drug has no influence on the antitoxic value of its serum. The fact that a homogeneous serum (that of another rabbit) has no action, as is also the case with the serum of the hen, while the serum of the horse or the cow produced good results, leads the author to infer that the antistrychnic action depends upon the power which the above sera possess, of producing in the animal treated, anti-bodies or antitoxins capable of fixing a certain number of the strychnine molecules. The antistrychnic efficiency of the various antitoxic sera, would seem to depend upon the fact that besides their predominant specific action, they have secondary actions, the side-chains of Ehrlich that are produced in cells sensitive to a certain poison, having either in their greater part a specific action and to a less extent secondary actions, or having this property, namely, that their specificity does not exclude the possibility that they are able to act against other forms of virus, in the absence of the one for which they have been elaborated. In view of the success obtained with the diphtheria antitoxin, the author suggests that it might receive some practical application clinically in the treatment of strychnine poisoning.

**The Communicability of Bubonic Plague to and of Bats.**—Many species of animals have already been investigated with reference to their susceptibility to this disease, according to B. Gosio (Archives Italiennes de Biologie, June 10, 1903). Rats, mice and pigs are spontaneously infected. Experimentally the disease has been communicated also to the muskrat, guinea pig, rabbit, monkey, cat, hen, sparrow and fly. Pigeons are rendered susceptible during the period of fasting, and lizards and snakes by raising their temperature. Immune are the dog, cow, hedgehog and frog. During

the light epidemic of the pest at Naples, the author had occasion to investigate the locality in which the epidemic had its origin, and found it infested not only with rats, but also with a large number of bats. He discovered experimentally that these animals contract the plague and succumb to it in a relatively short time, even after the subcutaneous injection of very small doses. All the internal organs are infected with the specific germs, which are again normally virulent to the rat and guinea pig. Characteristic is the marked splenitis. The parasites of the bat which has been killed by the disease may be infected with the germs, and thus, in all probability, transmit them to the ordinary channels of contagion. The remarkable number of different parasites, the special means of locomotion possessed by the bat and its extreme susceptibility, all give it an importance as a carrier of the bubonic plague.

## HYGIENE.

**Purification and Sterilization of Water.**—As a measure of safety, G. Mellère (Trib. Med., July 18, 1903) holds that all water for domestic use should be sterilized; and that the process of purification should not be confined to drinking water, but should extend to water used in washing vegetables and for other domestic purposes. Naturally the simplest measure consists in boiling, but chemical sterilization may be resorted to if desired; and for this purpose the author suggests peroxide of hydrogen in the proportion of 5 c.c. to the liter. Used in this proportion, it also serves to preserve uncooked milk forty-eight hours in the height of summer; and such treatment of milk in nowise alters digestible or nutritious qualities. The permanganates, in the proportion of 1 to 5 c.c. to the liter, are also serviceable in polluted water; the persistence of a rose color at the end of five hours indicating that the reagent is surely in excess. This excess should be destroyed by addition of a small amount of peroxide. Should purification with peroxide be used as described, the excess of that substance should be neutralized by addition of permanganate sufficient to produce a faint rose tinge; this in turn being caused to disappear by a trace of peroxide. Iodide of potassium, or better, tincture of iodine, may also be used for the sterilization of water; four drops of the latter in a carafe of water sufficing to render that liquid safe for drinking purposes within a half hour. The slight trace of iodine is not prejudicial to health and is neutralized by the food taken.

**Dissemination of Typhoid by Butter.**—This question has been made the subject of practical experiments by C. Bruck (Deut. med. Woch., No. 26, 1903). In these tests water was used to wash out the vessels in which the cream was kept, which had been contaminated by rinsing out in it a cloth slightly soiled with typhoid stools. Butter made from this cream developed colonies the first day, although the stool used for this purpose contained only about sixteen colonies to the plate. The author is inclined to believe that the bacilli are apt to be more numerous in butter than in a like amount of milk or cream. Living bacilli were found in the butter as late as the twenty-seventh day. The greatest increase in numbers occurred during the first few days.

## EYE, EAR, NOSE, AND THROAT.

**Persistent Intubation of the Larynx.**—Chronic post-diphtheritic laryngeal stenoses causing persistent intubation of the larynx are so infrequent that they have not received the attention which this serious condition deserves and the causes have not been fully appreciated. H. W. E. Berg (Med. Rec., Aug. 1, 1903) divides these cases into the following groups: (1) Cases in which the original conditions necessitating intubation persist beyond the usual length of time; (2) cases in which conditions have arisen during or subsequent to the original intubation and which may be due to (*a*) lesions caused by the injurious effect of the intubation tube upon the structures of the glottis, larynx or trachea; or (*b*) may be due to traumatism produced by the operator during intubation or extubation; (3) cases due to the paralysis of the vocal cords, either temporary or persistent. The conditions mentioned in the first group are simply of prolonged inflammatory lesions and might more properly be called protracted cases. In the second group, however, are cases which are the direct result of the insertion or the presence of the tube itself. Although the tube has been such a life-saving device, we should not forget that it is still a foreign body and that its presence in the larynx for any great length of time cannot help but cause some injury. Since the tube is in constant movement during its presence in the larynx, moving with each swallow, cry or even respiration of the patient, it is natural to suppose that unless it is of the proper shape and size serious lesions within the larynx are bound to occur. Decubitus sores, as such injuries are called, are, therefore, rather frequent and are usually situated (1) on the anterior wall of the trachea below the cricoid, due to pressure of the lower end of the tube; (2) above the cricoid over the lateral and anterior surface of the larynx, due to pressure of the retention swell, or (3) on the under surface of the epiglottis, due to pressure against the head of the tube. By far the most important of these is the decubitus above the cricoid laterally and in front, for here is the entrance on both sides of the recurrent laryngeal nerve, the motor nerve of the larynx, and it is urged that it is the pressure paralysis of this nerve which gives rise to the third group of cases, characterized by repeated coughing up of the tubes. Most of these injuries are due to the use of unskilful modifications of the O'Dwyer tube by operators who seem to forget the principles upon which the O'Dwyer tube is constructed. Such cases of decubitus may result in various degrees of stenosis, reincubation oftentimes simply aggravating the condition of the decubitus and finally resulting in permanent intubation to maintain an open passage. When the vocal cords are paralyzed as a result of pressure as described above the tube loses one of its most important means of retention, for the cords do not form a constriction above the retention swell. Thus it becomes very difficult to secure a tube in such a larynx, and it is believed that many of the very annoying and dangerous cases of frequent spontaneous extubations are due to this cause. The prevention of all these complications depends upon careful and skilful work, and an early appreciation of the development of such lesions.

## OBSTETRICS AND GYNECOLOGY.

**Cæsarian Section in Placenta Previa.**—It is impossible to fix upon any definite treatment for all cases of placenta previa, for they differ so much both in regard to the position of the placenta itself and also in regard to the variety of conditions in which the mother may be found. H. D. Fry (Maryland Med. Jour., July, 1903) holds that each case must be handled on its own merits. The tampon and leaving delivery is the best method in one class of cases; the forceps are best in another; podalic version in another; the combined external and internal versions in another, and, perhaps, Cæsarian section in still another. Modern methods have given valuable accessories to success. (1) The recognition of the importance of emptying the uterus in every case as soon as the diagnosis can be made; (2) asepsis has eliminated one great source of fatality; (3) the adoption of bipolar version, and (4) slow extraction of the infant has done much to lower maternal if not

fetal mortality. If the best method is adopted in each case the mortality should be from three to five per cent. Should so serious an operation, therefore, be adopted in a condition with no greater mortality than this? The mortality from Cæsarian section has also been greatly reduced by modern methods and the decision in regard to its use in placenta previa must rest upon the selection of the operation to meet certain combinations of conditions. If the position of the placenta is only partial insertion over the os and the cervix is soft and dilatable it is undoubtedly best to deliver by the natural passages. If, however, the woman is in good condition and is not exhausted by prolonged labor and hemorrhage, if the placenta is implanted centrally, or nearly so, and the cervix is undilated and undilatable, as is frequently found in primiparæ, Cæsarian section, when performed under the best conditions, is not only justifiable but undoubtedly gives the least mortality to the mother and greatly lessens the dangers to the child.

**Ovarian Transplantation and Reconstruction of Fallopian Tubes.**—The very annoying symptoms which sometimes arise from a double ovariotomy necessitated by a diseased condition of those organs frequently need serious attention and the fact that the menstrual function has permanently been stopped is sufficient reason to materially disorder, if not destroy, the subsequent happiness of some women's lives. F. H. MARTIN (Chicago Med. Rec., July, 1903) has encountered two such cases and has attempted to alleviate their symptoms by transplanting pieces of normal ovarian tissue from healthy women in whom other operations were being done, and to whom the loss of a portion of their ovaries was either necessary or at least not objectionable. He gives the details of the operations by which new Fallopian tubes were constructed by suturing the mucous membrane of the uterus to the peritoneum and leaving in a drain which was removed per vaginam after a week or ten days, and also the methods by which the ovarian tissue, carefully preserved in salt solution for the few minutes between the two operations, was sutured into the broad ligaments near the opening of the new tubes. In both of these cases there has been a resumption of many of the symptoms which usually accompany the monthly periods and also a gradually increasing mucous discharge at that time. The time which has elapsed (about eight months) has, however, not yet been sufficient to draw exact conclusions from these cases. Experiments upon lower animals have proved that similar operations may be so successful that conception may subsequently occur.

**Physicotherapy and Gynecology.**—Having used this method of treatment for the reduction or cure of fibroids of the uterus and for the prevention of neoplasms, J. RIVIÈRE (Gaz. de Gyn., July 1, 1903) arrives at the following conclusions as to its efficacy: (1) Ordinarily physicotherapy assists in the recrudescence of fibroids without using exclusively electrolysis, which, other things being equal, should not exceed in strength a current equivalent to 50 milliampères; (2) hydroelectric baths are recommended, with friction to stimulate the skin, remove the dead epidermis, also that the germs may be thus removed, and to assist in the removal of effete matters and organic poisons, and to help the general nutrition of the body. Carbondioxide baths are to be recommended, which, bringing the blood to the skin, stop the flow from the fibromatous uterus, and stimulate and re-establish the general equilibrium of the organic functions. The faradic currents of high frequency, mono- or bipolar vibratory massage are equally of powerful assistance in the treatment of fibromata, as is the continuous current. (3) The treatment by physical and electrical agents, the latter in particular, reduces the pain and metrorrhagia, brings about a return of general and local nutrition and produces a localized anemia and general purification. It is then an etiological medication, rational and scientific to the highest degree, and remarkable in that it is harmless and wards off the performance and necessity for an operation more or less grave. (4) Physicotherapy presents the evolution of benign tumors into carcinomata, principally in women suffering with arthritic diatheses, in whom also carcinomata constitutes a diathesis of the third decade. (5) Acting at the time to bring about epithelial hyperplasia and thickening ureterial involvements, nephritis and other complications; not finding surgery a supplanter of electrotherapy, either aggressive or destructive. Such then are the principal rules of treatment which, in the hands of the careful specialist, furnish a means to a double end and thereby are in truth an undeniable practical progress in the proper direction.

## THERAPEUTICS.

**Value of Iodipin.**—Now that several years have passed since iodipin has been introduced, H. WINTERNITZ (Münch. med. Woch., July 21, 1903) feels himself justified to pass a definite opinion as to its value. Its external application is to be condemned, for even if vigorously rubbed into the skin day after day, no iodine will appear in the urine. The rectal administration, too, is little satisfactory, for only 10 per cent. are absorbed into the system. The addition of pancreatic gland to the enemata somewhat increases the amount taken up, yet this method of giving the drug is very inaccurate. For internal use the 10-per-cent., and for subcutaneous the 25-per-cent. preparation, is used. Iodipin is not acted upon by the saliva or the gastric juice, even where pathological conditions of the stomach are present, nor does any absorption take place from the gastric mucous membrane. An absorption into the lymph-channels finally occurs from the intestines; the greater part of the drug is taken up unchanged and only a small precentage is split up owing to the alkaline reaction of the intestinal contents. In the blood, iodipin circulates in small amounts and in finest subdivision, and free iodine is constantly split off, to unite with the alkali salts present. As soon as this occurs, iodine can be detected in the urine and saliva. The time which elapses from the ingestion of 1½ to 5 grams of iodipin up to the detection of iodine in the saliva is generally only ten to forty-five minutes where the stomach functionates properly. It requires four to six days till 10 grams of iodipin are eliminated, while the same amount of potassium iodide is already excreted in two to three days. The fat, which is not at once utilized by the body, is stored up chiefly in the muscles, liver, bone-marrow and subcutaneous tissue. The slow assimilation explains why intoxication is not likely to occur. The amount of drug lost through the feces is very small; in one case where the feces were analyzed for many days it only amounted to 4 per cent. It also appears in the milk, both as such and as alkali iodine. Turning now to the subcutaneous administration, it was found that after long-continued use, iodine could still be found in the urine 402 days after the last dose was given. Here also the various internal organs and the blood give positive iodine reactions. Massage, bodily exercise and baths will invariably hasten absorption and excretion. It follows from all this, that iodipin is indicated where a prolonged effect is desired, especially since loss of weight and cachexia do not develop. In bronchial asthma, luetic endarteritis and lead colic much more can be accomplished than with the iodides.

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## HYPNOTISM IN INCURABLE ORGANIC DISEASE.

There is a considerable number of physicians, among whom not a few neurologists, in whose minds the practice of hypnotism is, for some reason or other, connected with quackery, and thus relegated to the class of questionable remedial means. The disrepute in which this frequently very efficient therapeutic agency is held, is entirely undeserved, for though by no means a panacea for every ill that flesh is heir to, it is undoubtedly of great utility in a certain class of cases in which its employment seems to be indicated.

That hypnotism has been of undoubted value in a great many functional disorders not even its most pronounced opponents will deny. Its use, however, in organic affections of the nervous system, though of rather recent date, already shows some interesting results which will undoubtedly attract the attention of the fair-minded and unprejudiced. Those of us who, whether in the clinic or in private offices, were compelled to confess our utter helplessness, in the face of organic diseases, to even alleviate to any extent the sufferings of the unfortunate patients, will be interested to know that in some of these cases hypnotism has brought about a degree of improvement and comparative freedom from distressing symptoms for an appreciable length of time.

Dr. Pevnitzy (*Roussky Vrach*, No. 26, 1903) describes a few of such cases, as observed by him in Bechterew's neurological clinic. In one of the two cases of syringomyelia of four years' duration, which did not respond to any extent to prolonged routine treatment with electricity, medicated baths, massage, strychnine, etc., a three months' course of hypnotism seems to have done the patient a great deal of good, inasmuch as his mental state, formerly markedly hypochondriacal and tinged with suicidal tendencies, became very hopeful; he enjoys good sleep, is able to swallow better than before, while his sensibility to pain and his temperature sense are gradually returning. This improvement, the author is quite sure, can only be ascribed to the employment of hypnotism in the case. In another patient, with transverse meningomyelitis, improvement, thanks to the addition of hypnotism to other treatment, was evidenced by comparative freedom in walking (on crutches), and a feeling of strength in the lower extremities, whereas formerly she walked with very great difficulty. In a tabetic, although the pains and gastric crisis were not markedly influenced by hypnotization, the author succeeded in improving his gait (comparative freedom in stepping over a polished floor as well as in climbing upstairs), and his general condition. Even in a desperate case of syphilitic meningomyelitis hypnotism brought about, temporarily of course, a condition of comparative quietude, and turned a quarrelsome, unbearable patient into one who became grateful and obliging. To be sure, the very great majority of these patients recognize but too clearly the serious nature of their condition, and are intensely interested in anything that carries with it some hope of relieving their suffering. They readily lend their credence to any promise on the part of the physician, and thus become easily suggestible, which fact is of great importance in obtaining favorable results from hypnotism.

## SUBCUTANEOUS INJECTIONS FOR SYPHILIS.

The discussion on the subject of the treatment of syphilis by subcutaneous injections of mercury, at the last meeting of the American Medical Association at New Orleans, brought out the fact that in recent years many more specialists in venereal diseases are employing this treatment than formerly. There seems no doubt in the minds of many men of large experience in the treatment of

syphilis that in certain fulminant cases of the disease a more certain and more rapid effect can be obtained by injections of mercury than by any other means. In visceral involvement, and especially when there are threatening symptoms of syphilis of the nervous system, these authorities prefer the hypodermic method, and the results appear to justify their conclusions in the matter. There are certain dangers, as for instance that of embolism, but it is now generally agreed that, even according to the most unfavorable statistics, this is extremely rare, occurring not more than once in about 3,000 cases. Recent clinical experience shows this accident to have been exaggerated and that occasional symptoms supposed to be due to embolus are really the result of the syphilitic process or of some intercurrent event which symptomatically suggests an embolic process in lungs or brain.

In a very large number of these cases it can readily be understood that coincidental pathological conditions will apparently point to some injury to the nervous system. Dr. Heidingsfeld's case in which, within a short time after an injection, a man developed paralysis of the muscles supplied by the facial nerve and seemed, when first seen, to be suffering from an embolus of the face area in the cortex, proved on more careful study to be simply a case of Bell's palsy. Undoubtedly some of the ill repute of mercurial injections is due to errors of this kind and it should not be forgotten that usually when mercurial injections are employed, symptoms of syphilitic invasion of the nerve centers are already present.

Recently Professor Jullien, of Paris, whose large experience with subcutaneous injections of mercury extends over a quarter of a century, and gives him a right to be heard with attention on this subject, insisted that far from being less prone to give mercury by injection, he employs it with increasing frequency, though by no means does he consider it suitable for all cases. His experience at the hospital Saint-Lazare, which is the lock hospital and prison for women in Paris, and in which all the prostitutes suffering from venereal diseases are confined during the infectious period of their disorders, makes his opinion of great practical value. Neither among these patients nor in his private practice, where he uses the injections whenever they seem advisable absolutely without any sense of insecurity has he met any untoward results.

His favorite materials for injection are the insoluble preparations, especially calomel and gray oil. Calomel is used in doses of about five centigrams for patients whose weight does not exceed 120 pounds, up to ten centigrams for patients who weigh 200 pounds or over. Injections are made every eight days until four injections have been taken and then the intervals are lengthened two days each time until about twenty days is reached as the period when usually the injections are repeated thereafter only about once a month. The technic, however, in this matter is eminently individual, and depends in a large degree on the way the patient reacts to the injection.

Professor Jullien has found the salicylate of mercury well borne and not at all likely to produce either severe stomatitis, pain or the nodular swellings that are sources of so much discomfort to patients when other mercurial preparations are given. Its action is slow but sure. Injections are given usually twice a week, each injection consisting of about six centigrams for an individual of average weight. Professor Jullien insists on the dosage of mercury being adapted to the size as well as the idiosyncrasy of the individual and considers that the salicylate of mercury is very effective in maintaining a moderate mercurialization over a long period.

There are certain advantages in the use of injections that cannot be ignored. Not infrequently has it been found that obstinate and unsightly symptoms of syphilis, which would yield to no other treatment, have yielded almost at once after mercurial injections were begun. The same good results have followed injections for peculiar nervous symptoms, especially those of generalized conditions evidently dependent on the affection of a number of blood-vessels in the central nervous system which have failed to be relieved by even a lengthy inunction cure. It is evident then that every practitioner who has a number of syphilitic patients in his clientele should be ready to give mercurial injections and should know the technic and something definite of the various preparations that have been recommended by specialists in this matter. Whether injections ever accomplish what has been claimed by some enthusiastic advocates of this method of treatment, namely an abortion of syphilis in an early stage, remains very doubtful. Certainly there are patients with many symptoms of syphilis present in whom the use of a few injections of mercury, repeated at longer intervals for a time, has been followed not only by the immediate disappearance of all luetic manifestations, but has put the patient in a condition where no other signs of syph-

ilis have ever appeared. The method has now been before the profession for nearly thirty years, so that such claims can be substantiated by clinical experience of a character to command respectful attention.

### UNSANITARY MILK RECEPTACLES.

Our attention has recently been called to an article written for a dairy paper by Professor W. W. Hall, of Cornell, setting forth the miserable condition in which empty milk cans are found when returned for refilling. With all the safeguards we now have for the protection of the public against harmful and inferior milk it is a trifle humiliating to find this very public acting so carelessly and unconcernedly in a matter of such vital importance to general health. Professor Hall is inspector in a factory where 30,000 pounds of milk are shipped every day to various cities in the State of New York, and he reports that a majority of the bottles returned are in a state too filthy to bear mention, and that the men who are accustomed to handling milk daily can scarcely endure the horrible stench coming from these receptacles.

It seems strange that in an enlightened country like ours, where the people are taught, through the newspapers and otherwise, the great value and necessity of preventing disease by prophylactic measures, that such abject and wholly unpardonable laxity should exist. It is certainly a small enough thing to do when a bottle is emptied to allow hot water to flow into it from the faucet over a kitchen sink and to pour it out again. This is about all that is necessary to clear the bottle of a culture medium in which nearly every kind of bacteria grows in tremendous multiplicity; yet human perversity is such that a like task proves too great for the tired kitchen maid, hence the result.

Professor Hall says: "I made a careful inspection of the cans, after the scrubbing process had been completed and they had been thoroughly treated with live steam, but the foul odor was still there. The dairy farmer is guilty of enough, the factory manager is far from perfection along this line, but no such abuse of milk or milk utensils ever existed at the farm or at the factory as these cans are receiving every day during this extreme hot weather, when the most careful and painstaking methods are necessary."

Yet reprehensible as this practice is, we can scarcely hope for an ultimate change at the hands of servants who constitute for the most part the offending class. The labor problem is already grown too complex to make this element an integral factor in its further development and solution, and we must turn, therefore, to some other way out of the difficulty. Best of all remedies, if it were possible, is the providing of a receptacle efficient enough, yet so cheap that it might be thrown away after emptying, or, better still, which might be burnt in the kitchen fire.

This, however, is not at hand, and until it is we shall have to resort to law. But, on the contrary, legal restriction on milk dealers is becoming so severe that many find it difficult to continue business with any profit. Be this as it may, a well-devised law, compelling the daily collection of milk receptacles from house to house, and a specification of the most effective means of cleansing the bottles and cans, would do much toward an amelioration of the present dangerous conditions.

We can only hope that the New York authorities will take the initiative in this matter.

## ECHOES AND NEWS.

### NEW YORK.

**An Undesirable Patient.**—Leo, one of the lions in New York Central Park, recently consulted an oculist, somewhat unwillingly, and his actions caused the specialist to decide that an operation "will not be necessary." Leo is suffering from a cataract in his right eye. Dr. W. R. Gilfillan said that the operation was not likely to be a success, and that with his left eye the beast could easily find his way about.

**New Women's Hospital.**—Work will soon be begun on the new Women's Hospital, in One Hundred and Tenth street, near Amsterdam avenue. The building is to replace the institution now at Lexington avenue and Fiftieth street. It is to be six stories in height, with basement and attic, and will cost $610,000. In equipment the new hospital will be one of the most complete institutions of the kind in the country. The first floor will have a lecture hall and chapel, the second and third floors will be devoted to private wards, and the fourth floor and the wings will have endowed beds. On the floor above will be a ward for critical cases, and the top floor will be the living place for physicians and hospital attachés.

### PHILADELPHIA.

**Radical Measures to Stamp Out Rabies.**—The State Live Stock Sanitary Board, because of evidence of rabies now existing among the dogs of Columbia County, has decided that all dogs in the county must be quarantined for 90 days. The death of the animal and a fine of from $10 to $100 is the penalty for violating the order.

**Increase in Typhoid and Smallpox.**—For the week ending August 22 there were 118 cases of typhoid fever as compared with 91 of the previous week. The new cases are distributed over all parts of the city, including those wards supplied with filtered water. Twenty cases of smallpox were reported, an increase of four. Director Martin, after a thorough study of typhoid fever conditions in the city is convinced

that from 25 to 35 per cent. of the cases are due to milk instead of water. A directory of milkmen and of establishments at which milk is sold is in preparation and whenever a new case of typhoid fever is reported the milk supply of the house will be traced and examined.

**Typhoid Fever in Schuylkill County.**—Typhoid fever is epidemic in Schuylkill, the disease having broken out at Ashland, Pinegrove, Pottsville, and several other places. The Pottsville Hospital is treating seven cases and there have been a score of deaths in the Ashland region.

**Director Martin Pays City Employees.**—It is stated that Director Martin has advanced $4,000 to complete the June and July pay rolls of the employes of the Municipal Hospital. The $15,000 appropriated by Councils was exhausted when the June pay roll was but half completed.

**Filtered Water Above Standard.**—Chief Hill of the Bureau of Filtration, declares that the best results ever obtained outside of a laboratory by a slow sand filtration have been reported to him by the engineers in charge of the Upper Roxborough plant. Schuylkill water containing 42,000 bacteria per cubic centimeter was purified by the sand bed completed a week ago so that the bacteria were reduced to 12. The highest amount left by any of the beds is 60 per cubic centimeter.

**Queer Verdict in the Ball Park Disaster.**—The Coroner's jury which investigated the recent disaster at the Philadelphia Ball Park by which 12 people lost their lives, found that the accident was due to the rotten condition of the supporting timbers of the stand. They recommend an increased number of building inspectors and that the inspectors be given more power. The queer part of the verdict was that the Philadelphia Base Ball Club, the former owners, was found responsible in not having made a thorough investigation of the timbers in the stand during its ownership and in stating at the time of transfer that the buildings on the ground were in first class condition. The verdict against a corporation that has passed out of existence is considered remarkable.

## CHICAGO.

**Hospital to be Enlarged.**—Alexian Brothers' Hospital has purchased a plot of land adjacent to the hospital, 485 by 125 feet, for $10,000.

**Appointment of Dr. Riebel.**—Dr. Ernst Riebel has been appointed an associated member of the County Hospital surgical staff.

**General Hospitals Require no Frontal Consent.**—Acting Corporation Counsel Fyffe has given an opinion to the effect that general hospitals are not required to secure the frontage consent of residents in the same block in order to build. Hospitals for the insane, inebriates and the treatment of contagious diseases require frontage consents.

**Impure Milk.**—Out of 760 samples of milk and cream analyzed in the Laboratory during the week, 60 were found below grade. Among these 760 samples from all sources there were 112 taken at the trains—before the milk had come into the possession of the city dealer. Out of these 112 samples four were found below the standard of butter fat, and 40 below the standard of total solids.

**Typhoid Fever.**—Although the anticipated increase of typhoid fever has resulted to quite as great an extent as was feared from the pollution of the city water several weeks since it has not yet been reflected in the mortality. Nearly all hospitals report an increase of cases—the net figures being about 28 per cent. greater than for the previous week. But the typhoid deaths reported are decreasing—only 8 during the week against 11 the week before, and 45 in the corresponding week of last year.

**Smallpox.**—Ten new cases of smallpox have been discovered and removed to the Isolation Hospital. The Chief Medical Inspector dwells upon the fact that none of these had ever been vaccinated, and that 7 of them were children ranging in age from two months to six years. The type of the disease this year is much more serious than last year. In 1902 there were 338 cases with only 5 deaths—a mortality rate of less than one and a half per cent. Thus far this year there have been 346 cases and 45 deaths—a mortality rate of 13 per cent.

## GENERAL.

**Electro-Therapeutic Association.**—The annual meeting of the American Electro-Therapeutic Association will be held at Atlantic City, N. J., September 22, 23, and 24, 1903. An unusually attractive program has been provided.

**Virginia Medical Society.**—The thirty-fourth annual meeting of the Medical Society of Virginia will occur at Roanoke, September, 15, 16, and 17, 1903.

**International Dermatological Congress.**—The fifth International Dermatological Medical Congress will meet in Berlin, Germany, September 13 to 17, 1904. The following subjects have been selected by the officers of the Congress for discussion: (1) The syphilitic affections of the circulatory apparatus. (2) The diseases of the skin in anomalies of metabolism. (3) Epitheliomas and their treatment. Dr. James Nevins Hyde, of Chicago, is secretary for America.

**International Congress for the Study of Tuberculosis.**—This congress will be held in Paris, September 24 to October 1, 1904. Subjects for discussion and special report will be: (1) Treatment of Lupus by New Methods ;(2) Early Diagnosis of Tuberculosis; (3) Comparative Study of the Various Tuberculous Affections; (4) Etiological Factors in Tuberculosis; (5) Value of Different Methods of Treatment of Tuberculosis. There will also be a technical section which will provide a scientific collection comprising anatomopathological, histological and bacteriological exhibits, statistics, plans for hospitals, sanatoriums and dispensaries, publications, and documents of antituberculous leagues, etc.

**Medical Care of Indigent Women in Algeria.**—In order to insure proper medical care for indigent women who cannot or will not, by reason of their special customs, consult a male physician, the French government is seeking to organize in all Algerian towns in which the Moslem population is of sufficient numerical importance, a corps of women physicians for the gratuitous treatment of such patients. A salary, proportionate to the amount of work done, will be paid, and a residence, medicine and instruments supplied. A dispensary has already been established in Algiers and Blidah; and others are to be opened in Oran, Tlemcen, Mascara, Mostaganem, Miliana Bône and Bougie.

**Plague Victims Die.**—Two of the bubonic plague victims on El Bajio ranch have died. The third patient has a chance of recovery. No other cases have been reported. Health authorities are confident there will be no spread of the disease. Stringent quarantine has been enforced and the houses occupied by the patients have been burned. Similar precautions were most successful in preventing the spread of the plague in Osos during the Mazatlan epidemic. El Bajio ranch is close to Sequeiros, Mexico, where the

last case of the plague occurred during the recent epidemic.

**Street-Car Accidents.**—Seven deaths per month by street-car accidents have been the average in St. Louis since the opening of the present year. The City Council has appointed a special committee to ascertain whether they were due to the lack of stringent laws, the non-enforcement of the present laws, the lack of efficient brakes and fenders, the carelessness of the motormen and conductors, or the employment of incompetent men by the street-car companies. The introducer of the motion stated that he had been in five street-car accidents himself in the past four weeks, and was convinced that, in many cases, carelessness alone was the cause.

**Protects Children's Health.**—Deputy Health Inspector Ferdinand Sauer of Jersey City yesterday reported to the Health Board that since the issue of the order suspending the sale of "apples on a stick," gastritis among children had almost entirely disappeared. Before the order the disease was epidemic in the Hudson City district and prevalent in other parts of the city.

**Pure Water for Ithaca.**—Assurance against a repetition of the typhoid fever epidemic of last March was given to the citizens of Ithaca this week when the Ithaca Water Company commenced pumping water from its new filter station into the city mains. For four days the officials of the company and the expert engineers from New York and Philadelphia have been testing the workings of the plant, but there was no announcement that the pumping of water would begin until last Sunday, when the news that purified water was at last to be had spread rapidly through the city, and thousands of people came to visit the plant. Six months ago Cornell University loaned the water company $150.000 for the building of the purification plant, and since that day there has not been a moment when men were not at work on it. The plant is pronounced by Dr. George A. Soper, representing the State Board of Health, to be a perfect piece of work.

**Grievances of the Indian Medical Service.**—Loud expressions of dissatisfaction with the rewards for their labor are heard at the home office from members of His Majesty's Indian Medical Service. Chief among the general grievances is slowness of promotion. As things are at present no officer can get the promotion which he has a right to expect until he has served for about thirty years. Expressed in terms of money this means that all officers who entered the service over the age of 25—that is to say, most of those now entering—can look forward to a pension of only £500 instead of £700, or possibly £950. It is suggested that all officers should be allowed to complete 30 years' service before compulsory retirement, and that every year's service over 25 should qualify for an additional £40 a year. Another grievance is the inadequacy of the present scale of pay. A class of educated native practitioners have created, and they not unnaturally get the larger part of the private practice which used to form a substantial addition to an officer's pay. Then the depreciation of the rupee causes a loss of about one-third of the pay as originally fixed. It has been urged, therefore, that the pay should be increased proportionately with that of the Royal Army Medical Corps.

**Mr. Edison in Medicine.**—Thomas A. Edison, the inventor, announced on last Thursday that he had branched out temporarily into medicine and had made a study of a cancerous growth which started on the arm of his assistant, after he had been burned by Roentgen rays. The inventor says he thinks he has hit upon a cure for similar cancers, although he will let the surgeons and scientific physiologists work out the problem. Mr. Edison's theory is that any cancer which begins on the surface, can be cured by the introduction of fresh blood from a healthy subject into the blood of the person affected.

**Memorial Fund in Honor of Dr. Reed.**—On August 15, a meeting was held in Bar Harbor, of friends of the late Major Reed, M.D., U.S.A., to whom in a large degree is due both the discovery of the mode by which yellow fever has been spread, and also the consequent suppression of that dire disease. Representative men were present from different parts of the country and letters were received from various members of committees already appointed to promote the collection of a memorial fund in grateful commemoration of Dr. Reed's services. Important suggestions were presented from President Eliot, Dr. W. W. Keen, Prof. J. W. Mallot and others. Dr. Daniel C. Gilman, chairman of a committee appointed by the American Association for the Advancement of Science, presided, and Dr. Stuart Paton acted as Secretary. Among those who took part in the conference were Dr. W. H. Welch, of Baltimore, Dr. Janeway, of New York, Dr. Abbott, of Philadelphia, Dr. Herter, of New York, Dr. Barker, of Chicago, Dr. Putnam, of Buffalo, Dr. Fremont Smith, of Bar Harbor, and Dr. Sajous, of Philadelphia, and besides these medical gentlemen, Bishop Lawrence, of Massachusetts, and Messrs. Morris K. Jesup, President of the New York Chamber of Commerce, John S. Kennedy, President of the Presbyterian Hospital of New York and William J. Schieffelin, of New York. The following conclusions were reached: That an effort should be made to raise a memorial fund of $25,000 or more, the income to be given to the widow and daughter of Dr. Reed, and after their decease the principal to be appropriated either to the promotion of researches in Dr. Reed's special field, or to the erection of a memorial in his honor at Washington.

Arrangements were made for the publication of circulars explaining this movement, and asking cooperation not only from the medical profession, but from all liberally disposed individuals who appreciate the value of Dr. Reed's services to mankind.

**X-Science Not for Animals.**—The Texas District Court at McKinney has decided against Christian Science as the proper treatment for animals. The case came from the county court in a suit brought by a farmer of Collins county against the Houston and Texas Central Railroad for so injuring his horses with a train that they died. The testimony was straight, and it seemed that the plaintiff would win his contention without doubt. He went on the stand in his own behalf, and what he said in answer to questions strengthened his case until the attorney for the railroad asked him what treatment he had given the horses. He answered that he had given them the Christian Science treatment only. He had prayed for them, but had put nothing on their wounds and had done nothing to relieve them. The jury returned a verdict for the railroad company.

**The Heroic Death of Dr. Salazar.**—Dr. Salazar, physician in charge of the American Hospital in Tampico, has given his life in a brave fight to check the yellow fever epidemic. No death of the summer has caused more grief among the classes with whom he labored, while the manner of his death has excited the greatest possible admiration for his bravery. The physician's labor during the epidemic was unremitting. Despite the warnings of friends he persisted

in working by the bedside of his patients long hours, sometimes without food and always without proper rest. To the American colony he was most assiduous in his attentions, and his direction of the hospital brought it to a high state of sanitary perfection. Dr. Salazar detected symptoms of the fever in himself less than a week ago, but not until the disease had progressed far did he relinquish the direction of his staff. Then he turned to studying the state of his own disease, noted every advance, and at the last cooly called for pen and paper and wrote his own death certificate. Since his death to-day the Mexican health authorities have made a careful inspection of the American Hospital, and their report declares it to be in an excellent condition.

**Obituary.**—After an illness of two days Dr. Phanelt Coe Barker, founder of Morristown Memorial Hospital and dean of the medical profession in Morristown, N. J., died in that city August 21 from angina pectoris. He was sixty-eight years old, and went to Morristown about forty years ago. Twelve years ago he founded the Morristown Memorial Hospital Association, which built the Morristown Memorial Hospital, the finest institution of its kind in Northern New Jersey. Every day up to a week before his death Dr. Barker made a personal visit to the hospital.

## CORRESPONDENCE.

### OUR LONDON LETTER.

(From Our Special Correspondent.)

London, August 8.

THE ANNUAL MEETING OF THE BRITISH MEDICAL ASSOCIATION—CANCER RESEARCH—THE LISTER INSTITUTE.

The annual meeting of the British Medical Association which took place at Swansea last week was the first held under the reformed constitution. Some anxiety was felt by those responsible for the new organization as to the working of the somewhat complicated machinery which has been devised to enable the Association to give expression to its corporate wishes. All went off without a hitch, however, mainly owing to the tact and moderation of Sir Victor Horsley, who was elected Chairman of the Representative Meeting which now controls the political action and general business of the Association. Neither tact nor moderation has hitherto been among the characteristics of Sir Victor Horsley in his public capacity, but his experience of practical affairs appears to be teaching him that the methods of the irresponsible agitator are out of place in a responsible official. Thiers tamed Rochefort, whom he had described as a *fou furieux*, by giving him a place in his government; and it may be hoped that a like cause may transform Horsley from a demagogue into a statesman. At any rate if the Representative Meeting under his management did nothing very remarkable, it must be allowed the credit of having done something, and that in itself is a novelty in the history of the British Medical Asociation sufficient to justify us in regarding this year's meeting as epoch making. The fundamental reform in the constitution of the Association is the transference of the center of power from the members in Annual Meeting assembled—which was little more than a fortuitous and momentary concourse of atoms—to a body of representatives elected by the Branches and sent by them to be the mouthpieces of their views. From the purely theoretical point of view this seems to be a distinct improvement, but in practice it will probably mean nothing more than a change in the name of the governing body. The real obstacle in the way of all useful reform is the profound indifference with which the whole matter is regarded by the bulk of the members. The fact is, medical politics are scarcely considered respectable by the majority of practitioners who have plenty of professional work to keep them busy. It is the young men who have nothing to do who naturally find time to occupy themselves with public affairs. *Plus ça change, plus c'est la même chose.* The British Medical Association, whatever may nominally be its form of government, must always be under the direction of an active minority. Of the scientific side of the meeting there is not much to be said. It is the rule of the Association that each year its President should be chosen from among the local luminaries, who, in a place like Swansea, are naturally not stars of the first or even of the second magnitude. The President this year is a worthy general practitioner whose address was marked rather by strong practical sense than by original thought or philosophic breadth of view. His best point was in reference to the fallacy of estimating the sanitary condition of the country by the general death-rate. A decline in the rate has, he said, perhaps tended to blind us to facts which lie a little below the surface. It is true that during the last thirty years the annual death-rate of all ages in England and Wales has fallen from 22.25 to 16.3 per thousand living, a gain of about 26 per cent.; but on the other hand the death-rate of infants under one year of age has risen nearly 2 per cent., while the birth-rate has diminished. Nearly half the total number of children born are dead within five years. The increased mortality among infants is due to diarrhea and enteritis, and the increase due to these causes is seven times greater in towns than in the country. Moreover, the mortality from diarrhea is much greater among infants artificially fed than among those fed at the breast. Although much of the mortality is due to the ignorance or carelessness of mothers, Dr. Griffiths sees in it an illustration of a defect in our sanitary administration. Our regulations as to the conduct of dairy farms and other matters vitally important to the health of infants are mostly of an optional character, and the local authorities in too many cases do not enforce them. In its social aspects the meeting was very pleasant. One of the most enjoyable entertainments was a visit to the Goddess of Song, Madame Patti, in her fairy bower at Craig-y-Nos. One of those privileged to see her in her home informed me that she is likely to visit America again before long. The annual meeting next year is to be held in the historic University town of Oxford.

The epidemic of cancer cures continues. This very day we are informed by the daily papers—which of course have the statement from "an authoritative source"—that Dr. Bashford, Director of the work done under the auspices of the Cancer Research Fund, and his assistant, Dr. Murray, have solved the mystery of the causation of cancer—or are on the eve of a great discovery. But alas! so many have with equal confidence proclaimed that they had found the answer to the riddle that one may perhaps be pardoned for feeling a certain skepticism as to the success of the most recent claimants. There is all the more reason for doubt, since only a few days ago, on July 30, a meeting of the Cancer Research Fund was held under the presidency of the Prime Minister, Mr. Arthur Balfour, at which a report was presented by the aforesaid Dr. Bashford in which the results of the investigations so far undertaken, were set forth but no mention was made of the momentous discovery in question. Indeed, the report dealt much more with work to be done than with anything yet acomplished. This is scarcely

to be wondered at, considering that the scheme of organized research is as yet scarcely "in being," and its operation is still seriously hindered by lack of funds. Of the capital sum $500,000, which it was estimated would be required for the effective prosecution of the work only a trifle more than a half has up to the present been subscribed. Doubtless it was for this reason that the Committee invited the aid of Mr. Balfour's persuasive eloquence, and if one were dealing with an enterprise under less august auspices, one might be tempted to suspect that the announcement of Dr. Bashford's discovery was made at what is thought to be the psychological moment for the same purpose. Some justification might perhaps be found for such a suspicion in the suggestive manner in which the hint that we are on the verge of a great revelation is coupled with a delicate reference to the hindrance to research caused by want of funds. One of the most important parts of the report is that dealing with therapeutics, the results of the Finsen light treatment, high-frequency currents and X-rays—methods somewhat oddly grouped together under the head of electrotherapeutics—have been the subjects of inquiries directed to those in charge of special departments at hospitals. Reports of some 400 cases have been submitted for the consideration of the Cancer Research Committee. The results of the treatment of rodent ulcer by means of X-rays are confirmatory of previous experiences. It is said that recurrence occurs in from 20 to 40 per cent. of the cases, but are as a rule as amenable to treatment as the primary disease. Complete healing was obtained in 141 out of 216 cases, of which detailed reports were sent to the Committee. This gives a proportion of 65 per cent. of successes. It is pointed out that as the majority of cases were inoperable or had already been treated by the knife and had recurred, this high percentage is very satisfactory. Of the remaining cases, improvement was recorded in 43, no benefit resulted in 16, while in 3 instances the disease was aggravated. With regard to other forms of malignant growth, the Committee state categorically: "The results so far brought to our notice do not establish the efficiency of any of these measures as curative measures in sarcoma and carcinoma." In view of the very many statements recently made in the high-class newspapers to the effect that the Committee would recommend high-frequency currents as the true and only cure for cancer, this pronouncement should be read, marked, and inwardly digested by the journalists who seek inspiration in medical matters from doubtful oracles. An especially satisfactory feature in the report is the indication of the fact that an exhaustive investigation on cancer in animals and its relation to the disease in human beings has been undertaken.

The Jenner Institute of Preventive Medicine is henceforth to be known as the Lister Institute. This change of patronage, which has been made with the reluctant consent of Lord Lister, is not due to any decay in the fervor of the cult of Jenner. The reason is that another Jenner Institute, which is a purely commercial concern, whose business is the manufacture of vaccine lymph, has been in existence for some years, and as the Institute of Preventive Medicine also manufactures lymph, there was frequent confusion and occasional conflict between the two establishments. London now has a Lister as Paris has a Pasteur Institute. The Lister Institute is well endowed, thanks to the munificence of Lord Iveagh who two or three years ago gave it $1,250,000. There is a close connection between brewing and bacteriology; hence there is a special appropriateness in the benefaction of Lord Iveagh, whose patronymic is Guinness, of double Stout fame, to an institute founded for bacteriological research.

## OUR VIENNA LETTER.

(From Our Special Correspondent.)

VIENNA, August 2.

EXAMINATION REGULATIONS IN AUSTRIA—WEIMAR UNIVERSITY—TRACHOMA IN THE AUSTRIAN ARMY.

THE Minister of Education edited the new examination regulations on December 21, 1899. These have been made chiefly according to the propositions of Exner, the secretary of the Minister. He also proclaimed in the society of Vienna physicians this new system, and was confronted with a sharp critique from an illustrious member of the Professors of the University. When the new regulations were first carried out, the students started a powerful movement against them.

The Professors of the University sympathized with the students, and to this fact was due that the Minister determined to make essential alterations. These were proclaimed on April 14, and their chief points are as follows: (1) The candidate who wishes to acquire the doctor diploma has to spend ten half years in the medical faculty, and pass three examinations; (2) The number of weekly compulsory lecture hours is 20, with the exception of one semester, when it is reduced to 16. (3) Semesters which were spent in foreign universities can be accepted only if the Minister and a committee of Professors give their consent. (4) Previous to the first examination the student has to attend lectures through four half years, of which two winters must have been spent in the dissection room. (5) Subjects of the first examination are: general biology, medical physics, medical chemistry, anatomy, histology, physiology; the first two subjects are theoretical, the others practical. (6) The second and third examinations can be passed after the finishing of the tenth half year. During the last three years the attendance at the following lectures is compulsory: Internal medicine and surgery, obstetrics and gynecology, ophthalmology, rhinology, otology, and dentistry, also vaccination. (7) The subjects of the second examinations are: Pathological anatomy and histology, general and experimental pathology, pharmocology and prescription, medicine, study of mental and nervous diseases; the second and third subjects are theoretical, the others practical. (8) The subjects of the third examination are: Surgery, obstetrics and gynecology, ophthalmology, study of venereal diseases, dermatology, public hygiene, medical jurisprudence; the last two subjects are theoretical, the others practical. (9) The censors have to pay attention that the candidate may be sufficiently expert in anatomy and physiology. (10) The whole subject of an examination must be laid down within six months. (11) All the examinations must be passed in the same University; only in exceptional cases is it granted (with the consent of the Minister) that one of the examinations shall be passed in another University.

The Weimar Ministry issued this decree, under the title, "What Shall We do In order to Remain Healthy?" comprising 21 hygienic rules, which I give in condensed form, as follows: (1) Take a daily bath; (2) wash your hands often, keeping your finger-nails trimmed and clean; (3) keep your mouth scrupulously clean and brush your teeth after every meal; (4) make your toilet before coming to school; (5) keep your clothing dustless; (6) white garments should be changed often; (7) clean your feet before entering school; (8) refuse of any kind must not be brought to the schoolroom; (9) never expectorate on the floor; (10) remove your outer garments on entering the schoolroom; 11 to 21 deal in the acquirement of plenty of fresh air; school-

rooms should be aired during recess; don't go too long without eating; walk and stand erect; never cross your legs; neither write nor read in dim light; and finally, complain to the schoolmaster if your place is either too cold or too warm, if you don't see or hear well, also notify the schoolmaster if there is infectious or contagious disease near your home.

There are between two and three thousand cases of trachoma in the Austro-Hungarian army. This vast number of cases induced the energetic interference of the Minister of War. He requested the Army medical staff to plan a method to obstruct the propagation of this terrible disease. Here is one of the methods: To concentrate the afflicted persons to one place, and to watch that no new trachomatic patient shall be allowed to enter military service.

## SPECIAL ARTICLE.

### BYWAYS OF MEDICAL LITERATURE.—XVI.

#### FROUDE'S VERACITY AS A PATHOLOGICAL STUDY.

SIR JAMES CRICHTON-BROWNE, M.D., has recently written an introduction to the new letters and memorials of Jane Welsh Carlyle, which are sure to overcome the prejudice created against Thomas Carlyle for his supposed unfeeling treatment of his wife as depicted by Froude's work on their domestic relations. Dr. Crichton-Browne is one of the most distinguished alienists in England, and his essay may well be considered a study in the pathology of lying with James Anthony Froude, the historian as the basis for his study. Froude, though one of the most picturesque and striking English writers of the last generation, and a man whose historical research should have given him a permanent place among the great writers of history, was constantly prone to be led away by his feelings into the expression of opinions for which no one else could find any foundation, but which Froude bolstered up by means of garbled quotations, special points of view and the hundred ways that a prejudiced man has of making his opinion seem justifiable. His picture of Henry VIII. as a hero was the most flagrant example of this, and has been properly labeled by such distinguished historical investigators as Green and Freeman.

It was a shock to the literary world some years ago to find that the domestic life of the Carlyles had been apparently intensely unhappy. Froude edited the letters of Mrs. Carlyle and made it very clear that she lived in a chronic state of unrest and conjugal discomfort. As a matter of fact there proves to be no foundation at all for such an opinion. Carlyle was a loving husband, as husbands go, and Mrs. Carlyle was herself not a little to blame for whatever of unhappiness there was, and seems also to have been one of those on whom imaginary ills, as women occasionally will feign them, had not a little effect. The review of the whole subject will unmake the false impression created by Froude's work and adds a new and piquant feature to the psychology of veracity and of lying. It is evident that some, gentlemen though they may be, and with the best of intentions and apparently with the best of information, will still be sure to see things awry as regards ultimate truth and to express themselves in such a way as to deceive others as regards the actual facts. We might ask them in view of this new evidence what becomes of the "Gouldian" phantasy regarding "eye strain" as a cause of conjugal infelicities?

#### IMMUNITY TO BEE STINGS.

There has long been a tradition that those who associated much with bees so as to be frequently stung by the insects gradually acquired an immunity to their severer effects, at least. This fact is confirmed by the observations of Dr. H. F. Parker, who devotes some time to bee culture in the neighborhood of Indianapolis. He relates his experience with bees the first year and the intense discomfort occasioned thereby. The stings lost some of the acuteness of their effects in the course of time, but this he attributed to his growing accustomed to them. In the second year, while transferring a swarm of bees, he was stung many times with very little pain or tissue reaction. He says:

"Sting followed sting in succession, in legs, arms, fingers, neck and face. I imagined what a picture I would present—closed eyes and swollen hands and feet. I worked on, and so did the bees. I could feel the needle-like thrust, but then it did not seem to pain as much, and at last I finished the task. With aching head, slight nausea and vertigo slowly coming on, I left my task with a sigh of relief for what was accomplished and filled with wonderment as to what my personal appearance would be.

"Imagine my astonishment to find merely slightly raised red spots, like little pimples, with the red sting in the center, as the result of each and every sting. I must have had something like forty of them on various parts of my body. My clothes were full of them; but, they being so thick, did not allow the sting to penetrate. The dizziness, nausea and headache left me and 'Richard was himself again.'

"When I again visited my bees I did not dread the stinging properties any longer, at least, not as much so as formerly, and then, and ever since, I have found that when a bee does sting me the pain is only sharp for an instant and there is an absence of the after-swelling.

"I have since been stung many more times than I was at that time, and yet none of the symptoms above referred to have been reproduced. Am I not, therefore, immune of the poison of the honey bee, at least to a certain extent? I firmly believe that the beekeeper becomes inoculated with the poison of the bee, and usually becomes proof, or at least immune, against it, is no more to be doubted than the fact that vaccination is a preventive against smallpox."

It is not surprising that bee stings should thus develop a protective immunity to their effects. Practically any poison thus introduced into the system in amounts insufficient to cause serious disturbance is followed by a protective reaction. The method of protecting small animals from snake poison and producing antivenene is founded on this fact. The stings of insects such as the flea and the mosquito produce in many individuals especially susceptible to their stings a corresponding protective effect if the person attacked stays in the neighborhood long enough.

#### SIR WILLIAM SMYTH.

The following verses were read at the unveiling of a memorial window in stained glass in the Ulster Medical Institute of Belfast, Ireland, only a short time ago. The window commemorates, with proper symbolism, the noble conduct of Dr. William Smyth, during an outbreak of typhus fever on the Island of Arranmore, off the coast of Donegal, one of the northern tier of Irish counties. Dr. Smyth was the nearest physician to the Island, and when asked to give his services rowed daily from the mainland, carrying not only medicine, but food to the fever-stricken peasants. His patients were so poor that he could never hope for anything more than gratitude from them. There was the greatest possible fear of infection throughout all the adjoining countryside. Typhus is still well known and much dreaded in three countries of Europe, Hungary, Russia and Ireland, and its well known contagiousness prevented him from obtaining help. Finally Dr. Brendan McCarthy, the medical inspector of the local government board, of-

fered his services for the relief of the afflicted patients. Together the two physicians obtained an old, leaky, abandoned boat, the only one procurable under the circumstances, and in this they carried the patients to the mainland. The boat leaked so badly that they were in constant danger of foundering. The old craft actually did sink, shortly after they had landed. Dr. Smyth caught the fever, and owing mainly to the fact that his efforts in behalf of his patients had weakened his resisting powers, he succumbed. All of his patients recovered. The verses which we reproduce here are, we consider, one of the best examples of medical memorial verse that we have seen in recent years. The story and its worthy commemoration deserves a place in the scrapbook of every practitioner of medicine, as a testimony to the fact that even in these sordid modern days the true professional spirit is able to raise men above the tendencies of the times and make them heroes in the highest sense of the term:

### THE MEMORIAL WINDOW.*

The veil is drawn—and from the jewelled pane
Flashes on straining eye and beating heart,
Emblazoned by the Limner's loving art,
A story fashioned in heroic strain.

Yet this, no fabled feat in days of yore,
No mythic song, nor legendary lay,
But all-true tale of this our later day,
Amid the wastes and wilds of Arranmore.

A lonely islet in the western wave,
Lashed by Atlantic surge and winter storm,
Through it came stalking Fever's spectral form,
Gathering her tribute for the yawning grave.

And men fled shuddering from her pathway—
Men fled, save only one, a man of men,
Who, lion-hearted, leapt into her den,
And battled with her for her anguished prey.

Alone across the strait his skiff he plied,
And knelt beside the sufferer's bed alone,
Till one, with heart undaunted as his own,
Sprang to the place of peril at his side.

And while the billows break on Arranmore,
Men still shall wond'ring tell, and wond'ring hear
How in a wave-worn barque of yester-year,
They piloted the sick from shore to shore.

No thought was theirs of home, of child, of wife,
Of worldly guerdon, or of worldly fame,
But theirs the spirit rapt, the heart-aflame
To render up, so others lived, their life.

And life from one was called for, and laid down
By him who first had braved the Fever foe.
His fellow wears the laurel here below;
But his the martyr's palm, the martyr's crown.

Alone he now hath voyaged forth again,
And ferrying o'er the unfathomable tide,
Beholds, encircled by the glorified,
The Sovereign Healer of the whole world's pain.

—Frederick Boas, F.R.U.I.

#### WEATHER PROGNOSTICATION AND ACHY FEELINGS.

Now that we no longer have any confidence in the moon or the special appearances of the clouds at night with regard to the moon, as having any significance for the weather, there is need of something else on which to base predictions since human nature is prone to prophesy. A writer in the New York *Independent*, for July 16, 1903, describing a summer's day in the country, suggests that while the clouds may mean much and such expressions as "the swallows fly low," "the cat eats grass," "the smoke drops down from the chimney," are all the crystallized wisdom of weather prophets from time immemorial, yet after all "the best rain prophesy that I know," he says, "is nerve irritability. If the boys are easily provoked (myself also) there is likely to be a shower."

Here is a weather prophet with ideas worth considering. Sometime it will come to be realized that many of the pains and aches that immediately precede and accompany damp weather, are not due to rheumatism, nor to the rheumatic diathesis, but are just plain everyday irritability consequent upon some change in nervous conditions which are caused by a drop in the barometer perhaps, or perhaps the hydroscopic variation in tissues which follows a change in the atmospheric humidity. Old people become walking barometers in their power to portend storms because the lessened elasticity of their arterial and vascular system prevents or at least hampers those changes in the peripheral circulation which would compensate for variations in barometric pressure. Whenever an injury has taken place around a joint this same state of affairs proclaims itself even in comparatively young subjects. All signs, however, fail in a dry time, so that the human barometer, like most other weather prophets, proves unreliable when it is most needed. It is probable, however, that a careful study of human feelings would enable the would-be weather prophet to prognosticate weather conditions with more assurance than any empirical study of the moon and cloud conditions.

* We owe our copy of the verses to the Irish Monthly, so ably edited by the brother of the late Chief Justice Russell.

## SOCIETY PROCEEDINGS.

### BRITISH MEDICAL ASSOCIATION.

*Seventy-first Annual Meeting, Held in Swansea, July 28, 29, 30 and 31, 1903.*

(Continued from Page 383.)

**Inquiry into the Relation of Vaccination to Infant Mortality and Acute Concurrent Infantile Diseases.**—Dr. J. M. Mackenzie of Kirkby-in-Ashfied said: "The lay mind is largely impregnated with the idea that not only is vaccination injurious to infant life—that is, that vaccination introduces into the infant's system many diseases which, by their manifestation from time to time, mostly in a chronic form, impair the individual's vitality and render life a burden, but furthermore it is believed that the vaccination process in itself is directly contributory to infant mortality. This last impression is the product of the conflict of medical evidence as observed at public inquests over infants dying soon after vaccination. The well-informed, who readily consent to their children being vaccinated, have a lingering suspicion that the process of vaccination has its origin in the barbarism of the past, and although they admit that the evidence in its favor as a preventive against smallpox is overwhelming, they are still imbued with the impression that many infant maladies follow in its train. The militant antivaccinator, conscious of this state of public feeling, finds his mission in palming off on a too credulous public fables, fancies, and surmises, too often colored by the individual opinions of a few medical practitioners, who may be for the time being—as, for instance, at public inquests—opposed to the vaccinator. Medical questions, especially those of a clinical nature, have always been misunderstood by the laity,

the educated among them as well as the ignorant, hence the physician, with serene confidence in the value of his art, may well afford to go about 'having compassion on the ignorant and those that are out of the way.'

"One is differently impressed when one finds among the followers of Æsculapius the same heterodox teaching. A few years ago I had posted to me a lecture on infant mortality by one who stands high in the profession as a specialist in public health, originally addressed to a lay body, a municipal corporation, who, it may be presumed, received its statements as incontestable, not falling within the domain of dispute. To my surprise I found that in describing the causes of infant mortality vaccination was given as one. Although unable to find that the writer had any very large experience in the work of vaccination or the treating of infants, yet the bare statement that vaccination was a cause of infant mortality made a far deeper impression on my mind than all the arguments of the antivaccinators I have encountered, and they have not been few. Engaged as I have been now for several years as a medical officer of health and public vaccinator to a fairly large urban district, I resolved to find out for myself, as far as reliable statistics would allow me, how much truth there might be in the allegation. The material for the task lay ready to hand, even if it involved a good deal of labor in classifying and tracing all the cases dealt with. In the first place, the registrar for the district provided returns showing date of birth, name of child and parent, residence and where born, for the last three years. The vaccinating officer, on the other hand, placed at my disposal his registers showing the number vaccinated and unvaccinated in the urban district for the same period. As medical officer of health, I received weekly returns of all deaths taking place therein, so that material for the inquiry was complete. Obviously, certain exceptions had to be made, so as to remove as far as possible sources of fallacy. (1) All infants dying under one month were not included, inasmuch as it was found that no child was vaccinated under one month. (2) All infants, whether vaccinated or unvaccinated, who were not born in the district, were excluded, although such were included in the vaccination and death returns, they were absent from the birth returns, and hence could not be dealt with. (3) All who had left the district, whether vaccinated or unvaccinated, were excluded, as it was impossible to trace what happened to them.

"The sifting process, beginning with January, 1900, and ending with July, 1902, left 987 infants to be accounted for whose fate up to the age of twelve months was ascertained in every single instance. In 1900, 329 infants were accounted for, of whom 242 were vaccinated, and of these last 22 died before reaching the age of twelve months, giving a death-rate of 9.09 per 100; for the same year 87 unvaccinated were traced, 13 of whom died before reaching the age of twelve months, being a percentage of 14.94. For 1901, 398 were traced, of whom 264 were vaccinated and 134 unvaccinated. Of the 264 vaccinated, 22 died before reaching the age of twelve months, yielding a death-rate of 8.33. Of the 134 unvaccinated, 22 died, a percentage of 16.41. For 1902, 260 were traced, of whom 200 were vaccinated and 60 were unvaccinated. Of the 200 vaccinated, 16 died before reaching the age of 12 months, yielding a death-rate of 8.00. Of the 60 unvaccinated, 10 died; a death-rate of 16.66. Taking the death-rate for the three years among the vaccinated and unvaccinated, we find the vaccinated yield a death-rate of 8.49 and the unvaccinated 16.01. It will be found on comparison that the death-rate among the vaccinated and unvaccinated varies but little in different years; that is to say, it does not fluctuate. Again the death-rate among the unvaccinated is practically double that among the vaccinated. An explanation of this may be impossible in the limited time at one's disposal, but will be briefly considered further on when discussing the social conditions and neurotic characteristics of those generally found as extremists, antivaccinators included.

"As the main object of this paper is to discover any connection between vaccination and infant mortality, it is necessary to group: (1) The vaccinated according to the age at which vaccination was performed. (2) Deaths among the vaccinated at various ages. (3) Intervals between the vaccinal process and death. (4) Deaths among the unvaccinated at various ages.

"If we compare the death-rate from the more common causes of infant mortality an interesting difference in favor of the vaccinated will be found:—Bronchitis and pneumonia claim 36.13 per 1,000 of the vaccinated against 39.57 for the unvaccinated; marasmus, 5.66 for the vaccinated against 39.57 for the unvaccinated; convulsions, 2.83 for the vaccinated against 10.67 for the unvaccinated; diarrhea, 14.16 for the vaccinated against 35.59 for the unvaccinated; and so on.

"Having regard to the great difference in the death-rate, it is necessary to give what I consider to be the explanation of this difference. Be it noted that I do not claim that vaccination keeps babies alive, but I suggest that the facts disclosed show it does not kill them. The first thought occurring in one's mind is that the unvaccinated are the unhealthy—the children of poor and ignorant people, who take little care of their offspring—and that the incidence of any disease falls more heavily upon them, and hence would account for the difference in the death-rates. From very intimate knowledge of the social condition of the parents of every child that died I am certain that this is not the explanation. Bearing on this aspect of the question, a factor of the greatest importance in the problem is that 94.4 per cent. of the vaccinations under consideration were performed by the public vaccinator, and that at least 30 per cent. of them were among the very poorest of the poor—the casual laborer, the out-of-employment, the ill-housed, ill-clothed, and ill-fed, the children of young people too early married, with neither means or knowledge for rearing up healthy children. We know that among such infantile mortality is alarmingly high. On the other hand, two-thirds of the unvaccinated were the children of conscientious objectors, who obtained their certificates of exemption. The antivaccinators in the district are found among the well-to-do of the working classes, the superior artisan, the small shopkeeper, the intelligent, if argumentative, teetotaler. I have often observed that these extremists were of a neurotic type, easily excited against anything that had the appearance of compulsion. There is a nervous tension in their ethical code which bespeaks instability and lowered vitality; their children die, not from want of care and nutrition, but by inherent constitutional defects. In the early years of their married life they had their children vaccinated, and after their death they quickly jumped to the conclusion that it was due to vaccination, and determined there and then, as if with a sacred vow, that no more of theirs should be vaccinated. This tradition passes from mother to daughter, and still their children die, probably in the same proportion.

"The next point in the explanation, and by far the most important is that the practitioner is extremely discriminating, and does not vaccinate the weaklings—that is, those likely to die within a year. The more care taken in this direction the higher the death-rate among the unvaccinated, as against the vaccinated.

"A popular impression, even among the profession, is that the vaccinal process acting concurrently with another disease imparts a shock to the infant, thereby accelerating its death. This statement is made with all the more show of authority if the infant is in delicate health. Almost every week instances of this description are reported in the newspapers, whereas as a matter of fact the vaccinal process is remarkably gentle in its onset, ushered in by no shock; there is nothing to be observed corresponding with the rigors of adults or the convulsions of infants at the onset of acute disease, for example, pneumonia.

"There is an even, gradual rise of temperature up to 100° or 101° F., with a quickened and full pulse; moreover, be it particularly observed that in delicate children and very young infants the vaccinal process with its accompanying symptoms is milder, and on the whole longer, than in the robust and more advanced in age. Instead of being a danger when running concurrently with other acute diseases, I believe it to be beneficial in many, and to tone down the symptoms of both pathological conditions, namely, the vaccinal process and the acute disease. Let me give a few instances: Beginning with the nearest in relation to vaccinia, let us take smallpox; it is well known that vaccinia running concurrently with the incubation stage of this disease renders the smallpox attack milder, and is altogether beneficial.

**Bronchopneumonia.**—"A child, E. B., aged three months, was vaccinated on October 23, 1902. The baby was not particularly robust, but her vaccination was quite justifiable. A cousin, W. H., of the same age, lived next door, the child of antivaccinators. This latter, a boy, was much stronger and more robust. Two or three days after the vaccination of E. B., both children appear to have had influenza, followed by bronchopneumonia. Under the impression that vaccination would aggravate the disease in the rather weakly baby, I was much concerned as to the issue, knowing full well that if the vaccinated infant died I should be blamed for having vaccinated her, and vaccination would be put down as the cause of her death. The pneumonic attack lasted in both children for about twelve days, and to my great relief I observed that the vaccinated baby stood the attack better than the unvaccinated one. The symptoms were not so acute, the temperature not so high, and recovery was equally satisfactory. The vaccinal process was also affected, the vesicles not so large, the areolæ not so acutely inflamed.

"The second case was that of an infant, two months old, whose mother was anxious to have him vaccinated before he was 'shortened.' On the fifth day after vaccination he developed acute capillary bronchitis, and for a day or two the baby's condition was extremely critical; that aeration of the blood was seriously interfered with was shown by several attacks of deep lividity. I fully anticipated a fatal issue by the seventh or eighth day, assuming as I did that the vaccinal process would be then fully developed and aggravate the condition. Not so, however; by that time the pneumonic process began to show signs of improvement; the vesicles were somewhat delayed in their evolution, were small in size with a small areola. I considered that as the vaccinia matured the acute symptoms of the pneumonia subsided, and so saved my patient.

**Measles and Scarlet Fever.**—"Several cases of these diseases running concurrently with vaccination were observed, with no untoward results. In one well-remembered case of measles, during a particularly malignant epidemic in which almost every case developed pneumonia as a sequela, it was observed that an infant whose vaccination ran concurrently with the development of measles, escaped pneumonia and made a better recovery than the others.

**Pertussis.**—"Of all the acute infantile diseases, none is more liable to complicate the vaccinal process than whooping-cough, the reason being that whooping-cough lasts longer than any of the others. It is interesting to observe how, with the development of vaccinia, the paroxysms of whooping-cough disappear—not that the infant's condition becomes worse, the aspect and general state improves. Of course, in a case of whooping-cough complicated by pneumonia, much the same thing happens; I have had very recently a severe case of lobular pneumonia in a child suffering from whooping-cough, and I observed very much the same thing happening; but in both conditions when convalescence is established the paroxysms return. I have had no opportunity of observing the so-called 'cures' of whooping-cough by vaccination; nevertheless, I am satisfied that the influence of vaccination on whooping-cough is decidedly beneficial.

**Influenza.**—"This, too, has a moderating influence on the vaccinal process, even though it may excite, as it has done in one well-recorded case, a latent vaccinia. A baby, A. T., aged three months, was vaccinated on December 6, 1901. Three groups of scarifications were made, two of which developed to full maturity, the pocks healed and left good-sized cicatrices. The third scarification never produced any reaction. On April 26, 1902, the baby contracted influenza from its mother. On April 30 a full-sized vesicle was observed at the very spot where the unsuccessful scarification had been made. This came to maturity with a distinctly-enlarged areola; a supernumerary vesicle was observed, showing that the areola was of more than normal reaction. The cicatrix from the delayed vesicle is more depressed, but not so foveated as the first two. The mother developed broncho-pneumonia of a severe type, the baby's attack of influenza was of a mild type and left no sequela.

**Congenital Syphilis.**—"Four babies were vaccinated at the age of about three months who were the subjects of congenital syphilis. Of course, the utmost aseptic precautions were taken, and in three of the cases mercurial treatment in the form of hydrarg. cum creta was begun at once. It was observed that during the vaccinal process the nasopharyngeal symptoms considerably subsided with the full development of the pocks, returning to their original condition at the end of a fortnight or so. In one case, the mother observed so much improvement that she considered it unnecessary to give the powders of hydrarg. cum creta with which she had been supplied. In some cases the vesicles contained large quantities of serous fluid, and, strange to say, the surrounding areola or inflammatory reaction at the base was much smaller. The pocks were slower in their development, and took longer to scab and heal up. When the scab separated a deep, sharply-cut ulcer is left with a clean base. In at least one troublesome case dressing with antiseptic care sufficed to induce a favorable healing.

**Zymotic Enteritis or Diarrhea, Tuberculosis.—Local or general.**—"These are conditions which I believe to be unfavorably influenced by vaccination. The most careful and conscientious practitioner may find himself suddenly involved during the summer season in the unpleasant position of having vaccinated a baby to find that in two or three days the child has been seized by zymotic enteritis. The suddenness of the collapse often following this state of things is very distressing, and may destroy the young life before much can be done for it. Of the deaths among the vaccinated enumerated in this paper one was of this description, dying thirteen days after vaccination, and I formed the

impression from this and other cases that zymotic enteritis, contrary to the other diseases mentioned in this paper, running concurrently with vaccination, is unfavorable.

**Tubercle.**—"I have also on record a well-defined case, aged seven months, whom I now believe, but did not at the time, to have been the subject of incipient phthisis. The child was vaccinated at his mother's request as she had been told it would improve his condition. During the vaccinal process everything went on perfectly normally and the pocks scabbed and healed within a fortnight. But very soon thereafter the tuberculous condition became more pronounced and he died four months later. Insanitary dwellings, overcrowding and filthy habits are immensely more dangerous to the recently vaccinated than the presence of such diseases as scarlet fever, measles, whooping-cough, and influenza. In small houses with large families of dirty habits with nothing cleanly in the house that either the vaccinated or vaccinator can touch, the utmost care has to be taken so that septic matter may not enter the wound. The Act of 1898 requires that insanitary houses should be reported to the medical officer of health and the vaccination postponed. This is no doubt as it should be, but the reforming zeal of the sanitary authority may be lukewarm; the time taken in putting the house in a safe sanitary condition may be so prolonged that the child may escape vaccination altogether.

**Insusceptibility.**—"The Vaccination Acts have throughout acknowledged the insusceptible, but true insusceptibility must be very rare. Four factors govern it, each of them temporary; first, and most important, potency of the lymph; secondly, the health of the individual; particularly is this the case if the child be vaccinated while in the stage of incubation of any of the exanthemata; thirdly, age; very young infants are less susceptible to successful vaccination than older children; fourthly, and perhaps to a very limited extent the experience of the vaccinator. Ill-health, particularly anemia, is a very common cause of insusceptibility for a time; let anemia be corrected, and the child will soon be successfully vaccinated. I have a case on record (M. E.) three times unsuccessfully vaccinated with active, potent L.G.B. lymph in the summer of 1902. The child was blanched and anemic, and for a time thereafter treated with iron tonics; when the anemia disappeared, the child was successfully vaccinated at the first operation.

**Eczema and Impetigo.**—"Both these conditions bring more discredit on vaccination than any disease of which I am aware. An attack of either, however far removed, is sure to be charged by the parents to vaccination. That vaccination excites dormant eczema and impetigo I have no doubt. The two following cases will illustrate this: E. R. and F. W., both the subjects of acute eczema at a very early age, were under my treatment for this complaint, and by the exhibition of Fowler's solution and other tonics made satisfactory recoveries, the skin affection disappearing completely. Two or three months later they were both vaccinated, and to my great annoyance both developed eczema very soon afterward. A. W., vaccinated on April 22, 1902, was perfectly clear when vaccinated, and remained so until after the healing of the scabs; then impetigo appeared about the neck and groins. She inoculated herself by scratching in several places, particularly on the thighs. Infection spread to other members of the family, who were not particularly cleanly. The vesicles produced by auto-inoculation in impetigo are very difficult to distinguish from vaccinia at certain stages. They scab with an areola and leave a scar. The scar is never foveated and seldom depressed. The members of this family have a romantic recollection of how vaccination spread to them all, whereas in reality it had nothing whatever to do with it.

"Let me conclude by asking a question that has often occurred to me: Granted that acute concurrent diseases modify the vaccinal process, tone down the symptoms, and delay the evolution of the pock, does it follow that in these cases it also modifies the protection which vaccination affords?"

**Security of Tenure of Office of Sanitary Officers.**—Dr. Joseph Groves, of Isle of Wight, said "when Dr. Lloyd Jones, one of the secretaries of this Section, invited me to read a paper on the security of tenure of office of sanitary officers, I replied that all which could be said on the question had been said; and Dr. Garstang, in his paper read before the annual meeting of the Incorporated Society of Medical Officers of Health in October, 1899, remarked that the reader of a paper in the State Medicine Section at the Cambridge meeting of the British Medical Association in 1880 apologized for bringing before the Association a matter which had been worn almost threadbare by discussion. But the subject is of such paramount importance to the highest interests of the community, and affects so intimately the well-being of the sanitary officer and the efficiency of his work that constant reiteration, both in season and out of season, is a pressing duty.

"Now, what are the circumstances? The country is divided up into sanitary districts administered by the rural and urban district councils and the corporations of boroughs, which are nominally supervised locally by the county councils in the areas in which they are situated, inasmuch as they (the county councils) have power to make representations to the Local Government Board. This useful provision is almost wholly neglected, I may say, while the power to withhold the moiety of his salary paid by the State, if a copy of his annual report is not in the hands of the county council within six weeks of the end of the year—a power never exercised by the Local Government Board—is being made use of to castigate and annoy the medical officer of health, and to diminish his authority and weaken his power for good in the district which he serves.

"A characteristic of the present day is a lust of notoriety, and in connection with local government in the provinces we find the same men members of several administrative bodies, thus forming a kind of official councillor class, who manipulate and control to a considerable extent local affairs. This fact may account in some measure for non-interference by the county councils with the district councils and corporations in sanitary matters, and for the persecution of medical officers of health who are not subservient to the particular members of the district councils whose aim is to dominate those bodies. That such domination is possible is due to there being very little local public opinion apart from imperial party politics and religious sectarianism, and membership of provincial councils, not excluding county councils, is falling more and more into the hands of the less-educated and of those who are prompted to occupy positions which enable them to protect their personal interests. There is, too, a certain timidity, a want of courage, a shrinking from opposition among those members of public bodies who wish to do their duty to the public and to serve their wards or parishes faithfully, and this favors the domination of the individual councillor.

"As the sanitary condition of any place in a district may directly or indirectly affect the whole district, so the sanitary state of any district may directly affect the sanitary well-being of the surrounding districts, and, indirectly, of the whole country. The Local Govern-

ment Board, therefore, representing the country generally, exercises great influence and authority in every district, an influence and authority which are increasingly necessary.

"Under the law each sanitary district must have a medical officer of health and one or more sanitary inspectors. The local authority selects these officers, and they cannot be appointed without the sanction of the Local Government Board, excepting in those rare cases in which the whole of their salaries are paid out of the local rates. As soon as they are appointed they receive from the Local Government Board—not from the local authority—their orders. These are very definite. The Public Health Act requires the medical officer of health to write a report annually on the health of his district, and the Local Government Board's orders direct him as to this report. In it, he is told, he is to describe everything which in his opinion either in the present or the future does or may, either directly or indirectly, affect the interests of the public health. He has no choice—even when obedience involves criticism of the acts, and methods of administration of his authority, which it often does. He is ordered to direct the inspector in his work, and the inspector is ordered to look to him for direction in his duties, subject to the superior authority of the sanitary authority. The relative positions of the medical officer of health and the sanitary inspector are thus accurately defined—the medical officer of health is the responsible head of the sanitary administration, and the sanitary inspector is his eye and hand so to speak.

"The terms of appointment of the sanitary officer are peculiar and most exceptional. Ordinarily in the public service, and even in private life, a man is engaged not for a definite term, unless for temporary work, but for so long as he is competent for his duties, or, as it is phrased, during good behavior. In this manner Poor-law officers of every degree are appointed, and they cannot be dismissed from office without the sanction of the Local Government Board. But outside London and Scotland the sanitary officer is appointed for a definite term—the sanitary inspector for a year, the medical officer of health with few exceptions for one, two, three, or five years. At the end of the term his appointment ceases, and the sanitary authority may proceed to select another to fill the post, and the Local Government Board, almost as a matter of course, will confirm their choice. The Board will not permit an appointment to be made without its sanction, but that having been given the Board is no longer interested in the officer; it demands only that it shall sanction the appointment of his successor. He has been dropped probably for obeying the orders of the Board, which he must obey, but that does not matter, and he has no redress whatever.

"It is evident from extracts from *Hansard* for 1872 made by Dr. Woodford that this extraordinary anomaly was not contemplated by the Legislature, whose intention it evidently was that after the first appointments, the appointments in the public health service should be permanent. Sir Michael Hicks-Beach said, in Committee on the 1872 Bill, that 'a five-years' officer, like an American President, would be afraid of displeasing those on whom his re-election depended.' And it is the opinion of Mr. Alexander MacMorran, the legal expert on the laws which regulate local government, that the Public Health Act, 1875, Section 191, provides for granting fixity of tenure. He says: 'The Local Government Board have power in cases of medical officers of health of urban and rural districts to grant fixity of tenure,' and he adds, 'it is obvious that great hardships might result from the refusal of the district council to reappoint an officer whose term had expired.'

"It is common knowledge that such great hardships have resulted in a large number of cases both to medical officers of health and sanitary inspectors from the refusal of district councils to reappoint them. Dr. Garstang, himself a victim, quoted 35 cases of medical officers of health which had come actually under his own notice who had so suffered, and these, of course, form only a small proportion of the total number. For the most part reappointment was refused because the officer had obeyed the orders of the Local Government Board; but there was one case in which the medical officer of health was also Poor-law medical officer. In performing his duties as parish doctor he had given offence, and as he could not be dismissed from his position without the consent of the Local Government Board his employers punished him by depriving him of his public health appointment.

"The extent to which this insecurity of tenure of office of the sanitary officer militates against the interests of the community and prejudices the greatest asset which the nation possesses, only the sanitary officer knows. The fear that he may not be reappointed at the end of his term of office constantly haunts him, and however much he may strive to lose sight of it, and however strenuously he may determine, whatever the consequences may be to himself, to act as a high-minded honorable gentleman, still the fact remains that moving bodies travel along the lines of least resistance, and, human nature being what it is, there is necessarily a desire to avoid friction with those placed in authority over you, and a man of generous mind makes undue allowance, perhaps, for ignorance and prejudice. He gets to feel he is the Ishmael of the twentieth century. He has offended so many people by doing his duty he is certain he will not be reappointed, and he asks himself to what good is it all. Well, I may be wrong, but it seems to me as a man of the world that the effect, and more particularly with certain temperaments, must be deterrent. Under such conditions the best possible is not obtained by the community from the sanitary officer.

"On March 8, 1895, Sir Walter Foster, the then Parliamentary Secretary of the Local Government Board, addressed a deputation in the following terms: 'The Board has arrived at a rather important decision, namely, that we consider these appointments for short periods and precarious tenure injurious to the public health. We are at one with you that men holding appointments for very limited periods cannot be expected to discharge their duties in that fearless and thorough manner which those duties require for the safety of the public, and we are anxious to encourage local authorities to give up the system of short appointments. We recognize that these offices are very delicate and difficult, as well as exceedingly responsible, and while a man is elected from year to year by a sanitary authority who may be offended by his zeal for the public health, we feel he cannot discharge his duties in the way they ought to be discharged.'

"In this utterance the Secretary of the Local Government Board—himself a medical man—eight years ago stated that it was the deliberate opinion, not of himself alone but of the Local Government Board, that precarious tenure of office was injurious to the public health, and in this opinion every person who is familiar with the question will agree. And, although the case for security of tenure of office may be permitted to rest here—for it could not be made stronger—it is but natural the sanitary officer should view the matter from his particular standpoint, for it is he who fully realizes that, as Sir Walter Foster puts it, in the discharge of duties which are very delicate and difficult as well as

exceedingly responsible, in that fearless and thorough manner which those duties require for the safety of the public, he suffers disability of a nature the like of which is unknown to any other person engaged in the public service. As Dr. Francis Vacher forcibly expressed it: 'The medical officer of health is an officer appointed *inter alia* to detect and expose the knavery of builders, to tax the rapacity of landlords, to seize and carry off the tainted goods of shopkeepers: yet these builders, landlords, and shopkeepers have absolute power over him, to strip the coat from his back and take the bread from his mouth.'

"But it is not simply that he may lose his office at the end of the term for which he was appointed, and thereby be called upon to suffer great hardships, but he has frequently to endure insult and persecution. He may be publicly disparaged and belittled and humbled and thwarted in his work, the object being to force him to resign or to bring about his non-election at the end of his term: and, if he be a strong man, he may be constantly threatened with dismissal from his post—a threat to which effect would be given much oftener but for the fear that it might be resented by the people.

"That a class of public servants who are doing a great and beneficent work, the value of which to the nation is admittedly incalculable, and for which they receive, speaking generally, altogether inadequate pecuniary remuneration, should be permitted to pursue that work under conditions which are inimical to it, and that they should be allowed to be penalized and persecuted, and to suffer hardships and indignities because they do their best to fulfil their obligations and obey the law, passes comprehension.

"Why is it? Undoubtedly the Local Government Board and the Government of the day are primarily responsible, but it is difficult to arrive at the considerations which influence the permanent officials. Since 1895, when Sir Walter Foster gave expression to the views of the Board, which were very much in agreement with those of the health officer, its President has steadily declined to receive any deputation on the subject, and it is only from opinions expressed by individuals from time to time that any idea can be formed.

"Another reason I have heard advanced is that sanitary officers would not do their work so well if the tenure of their offices were secure. This would be a valid argument were it true, but some medical officers of health hold permanent appointments, and no one can say they are worked less efficiently on that account; indeed, the effect must be the very opposite. The Poor-law officers of every degree are not less efficient because they cannot be dismissed without the consent of the Local Government Board.

"I have been told that it is in the minds of some of the permanent staff of the Local Government Board that in the course of evolution of the public-health service great changes may be made, such as have taken place in Scotland, and that, if the appointment of the sanitary officers were permanent, they would have to be compensated for loss of office. One can only hope as a citizen of a wealthy kingdom, which claims to be in the van of civilization, it is not true. It would be contemptible in the extreme if, after the sanitary districts were got into good order, the men who had done the work at so much cost to themselves should be simply sent about their business.

"But whatever the cause or the combination of causes which permit the continuation of an anomaly which occasions serious detriment to the interests of the public health, and is a gross injustice to the sanitary officer, I believe the medical officers of health have the whole-hearted sympathy of those of our profession who understand the question. That we have the very practical sympathy of the British Medical Association—the great representative body of the profession—is certain, for they are doing all they know, by promoting a Bill in Parliament at some expense, and by seeking an interview with the President of the Local Government Board. During the preparation of this Bill it was a graceful act of the Incorporated Society of Medical Officers of Health to request the Council of the British Medical Association to include the sanitary inspectors in its provisions. In my opinion it was right and just, for the sanitary inspectors have suffered as we have done, often because they were loyal to their orders and to us; and it has its advantages to them and to us, for it has united our forces by the withdrawal of their Bill.

"That the Bill will pass into law is not probable without the assistance of the Government, and that assistance is not likely to be rendered without the sanction of the permanent officials of the Local Government Board. In the meantime, by the kindness of our good friend, Sir Francis Powell, and of those who assist him by backing the Bill, we are keeping before the public the injury inflicted upon the public health and the disabilities of the sanitary officer.

"We of the British Medical Association have no choice as good citizens but to continue the agitation by pressing the subject upon the attention of members of Parliament in our respective districts, and upon all those who take interest in public affairs or who can influence public opinion. And in time I have no doubt, if we are true to our responsibilities, we shall succeed in removing not only a burden from our own shoulders, but a menace to the highest interests of our neighbors and that which is a great and serious reproach to England."

**The Appointment of a Minister of Public Health.**—Dr. Frank G. Bushnell, of Plymouth, said "Members of the medical profession including many medical officers of health, the British and Canadian Medical Associations in council, the Sanitary Institute of Public Health, the Manchester and Salford Sanitary Association, the Imperial Vaccination League, the County Council West Riding of Yorkshire, the Institute of Sanitary Engineers, the Workmen's National Housing Association, the Childhood Society, members of Parliament and Medical Societies have considered and expressed approval of the appointment of a Minister of Public Health.

"Such a Minister would act as a leader. The value of a leader is exemplified in science, statecraft, religion, war, commerce, and indeed in every sphere of human activity. The individual leads the way, others follow in his footsteps; for example, Kaiser Wilhelm, M. Pasteur, Lord Lister, Mr. Joseph Chamberlain, 'General' Booth. The importance of the individual and human factor is brought home in Napoleon's famous saying, 'Men are nothing, the man is everything.'

"We have illustrations of the abolition of disease consequent on the adoption of measures suggested by preventive medicine. With the appointment of a Minister this may be expected to occur more and more. For example: The abolition of smallpox in Germany; the abolition of rabies in England: the diminution of sepsis by 'Listerism;' the disappearance of leprosy with improved sanitation. Such are mere reminiscences of the possibilities of preventive medicine in the abolition of disease.

"Zymotic and tuberculous diseases are recognized as largely preventable. The Sixty-second Report of the Registrar-General of the United Kingdom for 1899 gives the deaths from zymotic diseases as 89,235, or 2,811 per million of population. Tuberculous diseases

destroyed 60.659, or 10.4 per cent. of deaths from all causes, 1,911 per million of the total population thus arose. Alcoholism caused the death of 2,871, or 112 per million living among males and 70 among females. Cancer and malignant disease destroyed 26,325 persons, or 829 per million of all ages and both sexes. As to the infant mortality, 163 infants under one year of age died in 1899 in every 1,000 of the population in England and Wales. It has increased from 149 in 1871-80, and this implies heavier incidence of disease in infants, with ill-effects in after-life. There were 82,103 deaths in lunatic and idiot asylums, or 14.1 per cent. of the total deaths in England and Wales.

"It is hoped that such a list of mortality figures will set men thinking. It cannot be accepted from any point of view as the ideal of the art of citizen making. Without being convinced that the national physique is degenerating, as has been argued from the reports of the Inspector-General of Recruiting—from the decline in the birth-rate, from the increase in the death-rate of infants under 1 year old, and from statements made by members of the Royal Commission on Physical Condition in Scotch Schools, yet the most optimistic of us must be impressed with the fact that the health and physique of other countries is said to be markedly improving.

"It is claimed by those skilled in vital statistics that one-third of the deaths annually registered are dependent on causes which proper administration of sanitary measures could remove. It is said that the appointment of another Minister would lessen the individual weight of those that exist. The withdrawal of highly specialized duties from overworked departmental heads cannot be construed into a loss of prestige. It is merely a development in the natural order of affairs. The superintendence of the health of millions cannot be practicable in addition to other vast and onerous duties.

"Just as—or even more so than—a municipality and county appoints its medical officer, so should the nation. It cannot expect to be served for ever by other officers, however able and strenuous they are.

"Again, it is said that the effective discharge of public health regulations must eventually devolve on local authorities. True, but a Minister would act as the best incentive to proper sanitary progress by many. A superfluity of Ministers is said to exist already. Surely if many have been found good and necessary in the past, we must rely on our experience and appoint another, if indicated.

"Again, I am asked if existing arrangements are really sufficient. To this I would answer by a question. Are the preventable diseases diminishing as instinct and science tell us they might? Do medical officers of health of districts of schools or of troops believe that the interests of health are thoroughly guarded? As for a Minister restraining progress, I am sure in the long run the gain to the interests of health by a leader, especially a trained one, would far outbalance 'official' tendencies in its narrow sense. Further, looking back on those who have guided us in other matters in the past, can we say from a broad basis of judgment that we should have been better without their services?

"It is thought by some that the formation of a ministry would detach sanitary administration from other departments of local government and cause friction with the Local Government Office. However, the appointment of a Minister of Education has, curiously enough, been coincident with the actual unification of education and local government. It may be concluded that it is possible for a Ministry of Health and Local Government Office to cooperate harmoniously, the more so perhaps when we remember that the administration of the public health is combined and included in other countries in State offices of Agriculture, Navy, Education, and Police.

The question of expense is met to a certain extent by the fact that in a new Health Ministry certain officials are already existent but scattered among many departments; and also that saving of money results from prevention of disease, and in any case cannot be judged from the point of view of £ s. d. The mover of a resolution in favor of a Ministry of Commerce at the recent annual meeting of the Associated Chambers of Commerce, gave it as his opinion that commerce is the foundation not only of the prosperity of the people but of the empire itself. Another speaker said that it was obvious that commerce was its very life. This is indeed an erroneous view. What position would this country have held without its vigorous health, its bodily mental and moral 'grit' in the past? Lord Beaconsfield went so far as to say that 'the health of the people is really the foundation upon which all their happiness and all their power as a nation depend . . . but if the population of that country is stationary, or yearly diminishes in stature and strength, that country is ultimately doomed.' What does Ruskin say? 'There is no wealth but life.'

"The apathetic who expect the world to stand still in its course and present arrangements to suffice must remember that there are numbers who exist under conditions of 'sanitary injustice' at present, and without a leader they are helpless.

"In the Minister many would see the embodiment of a principle the importance of which is absolute but unrecognized frequently. It is that, whatever the demands of complicated modern life make upon us, whether in crowded communities or rural districts, on land and on sea, in this country or in our great tropical colonies, the natural or physiological laws of health must be obeyed or exact their toll inevitably. The Minister would regulate the balance between the forces of Nature and civilization. The Minister would add weight to the recommendations of local sanitary authorities, would assist those in need of help, would stimulate the apathetic, and would remove such limitations as unduly bound others, would be compelling to those who wilfully neglect their duty. Unnecessary interference would be avoided. The guiding light which would steer the Government barque between the rocks of neglect and interference would be the health requirements of the people based on scientific medicine.

"The value of the work done by voluntary effort in this country is, and will be, enormous. This is right. It is said that every great sanitary improvement has been initiated by voluntary or local action, and this is truth.

"The Local Government Board was established in 1871 to concentrate in one department of the Government the supervision of the laws relating to the public health, and the relief of the poor and local government. Its constitution is probably familiar to you, and it may be remembered that it originated partly on the recommendation of the Royal Sanitary Commission (1869-71), who expressed the opinion that, if such a Ministry were established, separate secretariates—one for public health and one for the relief of the poor, would be found necessary. This was not carried out, however, but all administration was concentrated in the hands of one secretariat, and was in fact a continuance of the former Poor-law Office.

"The Royal Commissioners had expressed or implied that the new authority would be a 'motive power' of no mean degree for promoting sanitary progress. It is impossible to avoid a comparison of such a stimulating

plan of action with the policy of the Board in 1888, when it desired to transfer to county councils all the powers which it now has under the Public Health Act of enforcing on defaulting district authorities the performance of their sanitary duties. In 1903 there are yet more county councils without than those with medical officers of health, I learn. It was obviously a premature effort at decentralization. The powers and duties of the Board are those of the Poor-law Board with those of the Privy Council. All the powers and duties of the Home Office in relation to public health, drainage and sanitary measures, local government, local returns, and local taxation. The growth of its duties is steady and continuous. It has legislative powers of making rules, regulations, and orders, and confirming by-laws. Its administrative control varies considerably; over Poor-law matters it is complete; over municipalities the Board has no direct control. Over sanitary authorities that Board has considerable power; it can force them to carry out sanitary measures to its satisfaction. Other powers have been conferred upon it, and it has certain obligations. In 1888 it received the central control of the county councils, an omen of future expansion as the tide sets in towards local government *pari passu*.

"The expanded Medical Department of the Board, the General Register Office, and officers from other departments would well form a basis of the Ministry. Associated with it should be a consulting body of representative or eminent members of the medical profession, for example, the Presidents of the Royal Colleges, a medical officer of health of schools, of factories, of Poor-law patients, prisons, navy and army. A veterinary surgeon, statisticians as the registrar-generals, an alienist, a pathologist, a sanitary engineer, and architect would be most suitable consultants.

"Education would be the most powerful engine that a Minister could exert in developing that 'health conscience,' which is desired in Scotland. The present system is too slow a process in this country, and the most effective way to protect the interests of the general public is to create a strong central department with effective control of local departments. It appears that local authorities when combined overawe even Parliament itself, and Parliament must be supreme.

"In a few words, the Ministry would deal with the records of disease, vaccination and revaccination, with outbreaks of epidemics and infectious sickness, with the regulation of injurious trades and industries in relation to health, with the prevention of filth, and with the infant mortality. Hospitals of all kinds, open spaces, gymnasia, swimming baths would all be advised upon; attention would be drawn to deficiencies; the adulteration of food and drugs, analysis of water, etc., would be dealt with; diseases communicable from animals to man, chemical and pathological research as to the causation and prevention of disease of mind and body at home and in our colonies; bacteriological investigations of human and animal morbid conditions, etc., would be supervised.

"Education in hygiene would be studied and inculcated as of paramount importance. The returns of the coroners' courts and meteorological observations would be collected. The Home Office might see fit to part with the supervision of the health of workers, prisoners, police, and lunatics.

"The Veterinary Department of the Privy Council would well be associated with the Ministry. The Minister would perhaps serve the interest of the public health best if he were not liable to change with every Government. He would be an adviser rather than a participator in the fierce and often unnecessary party strife of politics. Indeed, he might be definitely cut off from the collective responsibility of the Cabinet and be only summoned to the meetings of the Cabinet which had to do with his department. It is in the power of the Sovereign to summon any privy councillor to any Cabinet for any particular purpose and there is no obvious reason why such a course should not be adopted in this case.

"In conclusion, I may say that a list of eminent men could be given who advocate the creation of a Ministry of Health. It is difficult, with the present figures at my disposal from other countries, to compare satisfactorily the various National Health Departments, but I may say that Canada and the United States are moving toward such a separate office; Germany, France, and Italy may be said to have already compulsory physical education in their systems of military training.

"If I can arrest the attention of this meeting on the central idea of the necessity for Ministers of Public Health presiding over a national organization I am well content. I beg to move 'That this meeting is of the firm opinion that a Minister of Public Health would possess great potentialities for improving the national health, and would eventually benefit it largely. It is further of the opinion that the Council of the British Medical Association should advise that a Government inquiry be made into the advisability of uniting the public health work of various departments into one Ministry under the control of a Cabinet Minister.'"

Mr. Herbert Jones, of Hereford, sympathized with the object which Dr. Bushnell had in view, but maintained that there was already a Minister of Public Health in the President of the Local Government Board. A fatal flaw in Dr. Bushnell's proposal lay in his suggestion that the Minister of Public Health should hold office irrespective of change of Government. The discussion of the subject was opportune in view of the probable introduction within a short time of a Public Health Bill for England and Wales.

Mr. H. H. Tidswell, of Chester, said that in the interests of public health he would like to see increased powers given to medical officers of health for the purpose of daily inspection of houses in every town, with the view of preventing the spread of infectious diseases and for the purpose of warning those parents who persistently neglected the health of their children. To carry out this system the medical officer of health should have the power to appoint the general practitioners of different districts to carry out this work, and to pay them according to the work done. It was desirable to make the experience and knowledge of the general practitioner available for the public health service, but not gratuitously as it was at present.

Dr. Joseph Groves, of Isle of Wight, said the difficulty was that the Treasury did not grant the Local Government Board sufficient funds to enable it to employ more assistance, and consequently there was always a block of work. The medical department was only one of the departments of the Local Government Board, and it would appear that the reports of this department were considered by the permanent secretaries, with the assistance of the medical officer if considered necessary. He believed that at the moment the greatest amount of good to the public health would be found in security of tenure of office to sanitary officers.

Mr. H. D'Arcy Ellis, of Stourbridge, did not see what advantage was to be gained by the appointment of a Minister of Public Health. He believed he had the honor of being the first medical officer of health who obtained security of tenure. He did not know that the security which he now had made any difference to the good relations existing between himself and the local council; but he did feel that more backing up was required, somewhat on the lines on which he believed the

Factory Department was now administered under Dr. Whitelegge, and carried out under the medical inspection of Dr. Legge. As to educating public opinion, he believed that the public were becoming much more alive to the necessity of good sanitary administration, and there was growing up a healthy public opinion which would bear good fruit; he was quite sure that in his own district much more interest was being taken in sanitary questions. Of course, his reports did sometimes bring him and his council to close quarters, especially when inquiries were made from the central department, but these matters were always adjusted by the usual stereotyped reply, and did not always end as satisfactorily as the medical officer of health might desire.

**Physical Degeneration in Children of the Working Classes: An Inquiry Into Its Causes and Suggestions for Its Remedy.**—Prof. Herbert H. Tidswell, of Chester, asked "What is meant by physical degeneration? It denotes a condition of mind and body below the normal standard of development—deficient in vigor, activity, and endurance. The object of my paper is to draw attention to certain psychological influences which to my mind are responsible for the nervous restlessness and waywardness so characteristic of the children attending the schools under the Education Act. It is not my intention to dwell on such well-known factors of disease as starvation, exposure to cold, improper feeding, want of rest, want of fresh air and sunshine, and insanitary dwellings. I think no one will deny that the standard of health among school children in our large towns is lower than it ought to be. I will not be so rash as to assert that it is lower than it used to be; but it certainly is not so high as it ought to be, considering the advances in all departments of sanitary legislation and the improvements in hospitals and dispensaries for the free treatment of the poor. It is evident to my mind, as the result of my investigations, that there is some factor having a bad influence on the health of children which did not exist before the new system of education came in force. The children of the working classes of the present day commence school attendance too young. The period of school attendance is much longer and the course of studies much harder than it was under the old system. The rules of the new system put burdens on the teachers and pupils not easy to be borne with equanimity, while the system of cram is turning children into talking machines and injuring their reasoning powers.

"These are powerful factors in producing cerebral congestion. The mind of a child is remarkably sensitive. Harshness and severity, either on the part of a teacher or parent, will destroy the happiness of a child's life, disturb the appetite and digestion, and drive away sleep. A child's anxiety to please a parent or teacher, if unsuccessful or not appreciated, will have the same effect. I know from personal experience that fear may have a paralyzing effect on the mental faculties. In my early school days I had a severe master; one day he flew into a temper, and threatened to cane me because I was slow at mental arithmetic. My difficulty was to add 8 and 1 together, but so long as he stood in front of me with his cane I was too frightened to utter a word. I have seen several cases of chorea occur in girls as the result of school worry. It is my opinion that many cases of hysteria and other nervous maladies in young women of ovarian and uterine origin may be traced to over mental strain during school life.

"To return to children. It is an axiom that the physiognomy is a certain index of the state of the feelings, for example, when a child is happy and content, his face will show his state of mind. When he is irritable, tired, or overworked, the child's face will bear a pained, weary, haggard, or careworn expression. It is natural to assume that boys and girls are usually glad when lessons are over and they can go and play or return home for dinner.

"I have often stood still outside schools to note the expressions of children coming out of school. A few only had a look of joy and happiness. The majority had a sad, careworn, haggard look, suggestive of mental strain. The behavior of some was so unnatural as to lead me to suppose their brains were highly irritable. I saw one boy take his overcoat, fold it up, and then kick it along the pavement. Did this indicate a healthy state of mind? When I was called upon to treat delicate or nervous children I invariably ordered rest from school for several months which was usually followed by improvement.

"Parents have frequently complained of the severity of the school regulations and occasionally of the severity of the teachers. Children's brains are delicate organs and require gentler treatment than they often receive at the hands of their teachers. The cram system of the present day is both demoralizing and degrading and is calculated to render the judgment unstable and capricious and to interfere seriously with the mental equilibrium. The development of the body is seriously retarded by a morbid condition of the cerebrospinal system. In some schools it is customary to punish children who are late for school by a stroke of the cane on the palm of the hand. I have never seen this punishment inflicted, but I imagine it is greatly dreaded as children take great pains to be in time. I think corporal punishment should be absolutely forbidden in school.

"In some towns parents have difficulty in getting permission from the teachers for their children to remain at home in cases of sudden illness; many parents are unable to afford a doctor's fee, and hence cannot obtain a medical certificate. They are often afraid to allow a child to remain at home when ill. I recently met with a sad case of this nature. A poor woman in charge of a little grandson kept him at home from school for a day or two, as he had a violent cough and was very ill. The school attendance officer called and inquired why the boy had not been to school. He was told the reason, but did not think it satisfactory, so he gave strict orders for the boy to return to school. The boy was too frightened to disobey, and went to school, but almost fainted in the effort of getting there, while his cough disturbed the whole class. As his illness became worse the grandmother got alarmed and sent for me. I went to the house at once, and found the boy very ill in advanced consumption; he was treated with the greatest care, but he got gradually worse, and death terminated his sufferings in the course of a few weeks. In another case a boy was attending school for a week while suffering from scarlet fever.

"I think I have said enough to prove that the medical aspect of our system of national education is far from perfect, and that it is probably a powerful factor among others in the lowering of the standard of national physique—mental and bodily. Few men have the same opportunities as general practitioners of studying child life under the Education Act; they alone and the parents can trace the connection between mental strain, nervous instability, and disease.

**Suggestions for a Remedy.**—(1) "If possible remove the cause of mental strain and abolish the cram system. (2) Let all schools be under systematic medical inspection, let a medical officer be attached to each school, who shall inspect each class as it assembles to detect infectious or other diseases in the early stage, who shall examine the eyesight, the hearing, and general condition of each child and keep a report of the same.

who shall visit any pupil at home in case of sudden illness and give certificate to same. A measure of this kind would entail cost, but in the end it would be true economy, it would save a vast amount of suffering and ill-health, and would help to raise the standard of national health.

"In conclusion, it may not be amiss to point out that the object of education, before the introduction of the Education Act, was to train boys and girls for their duties in that station of life to which it had pleased God to call them. Whether that is the object under the present system is a question I will not presume to answer. My last words are an earnest appeal to parents. Remember the words of our great poet, Lord Tennyson. 'Self-reverence, self-knowledge, self-control. These three alone, lead life to sovereign power.' Teach your children this lesson, and they will bless you in after-years."

Dr. Dawson Williams thought that "some definition of terms was needed. What was meant by the term 'physical degeneration?' Did it mean a progressive degeneration of the race? If so, there was not, so far as he was aware, any statistical evidence that the amount and degree of degeneration in the population was increasing. Theoretically, the proposition involved the assumption that acquired characteristics could be transmitted, and those who accepted the doctrine of Weismann would find great difficulty in accepting that assumption. The practical question appeared to be whether the factors which tended to prevent adequate physical development could be removed? Whether these factors were more operative at the present time than fifty years ago might be an interesting question from the historical point of view. He hoped that the inquiry into the causes of the defective physical development which existed in many populous districts would not be mixed up with the question of the causes of the decline in the birth-rate. The two matters were distinct. The steps to be taken to safeguard life from the time of conception formed a field of work sufficiently wide, and attention should be given to safeguarding the health of the mother during pregnancy. The food supply of the poorer classes in populous districts differed from the supply thirty or forty years ago in respect particularly of the large increase in the use of preserved foods. Whether the use of starchy foods for infants had increased or not it was undoubtedly excessive, and the condition in which milk reached the infants of the poorer classes was another factor which deserved remedy. He believed that the defects in the diet of infancy and youth caused a condition of defective nutrition which produced not only imperfect physical development, but imperfect or retarded cerebral development, which was the cause of what was called over-pressure."

Mr. J. M. Mackenzie, of Kirkby-in-Ashfield, believed that physical degeneration was both acquired and transmitted. School children who left school very healthy soon degenerated when occupied in unhealthy employment. Physical training was greatly needed. Children's homes should be improved, and they should have more recreation and better food. The marriage system must also be looked to. People were allowed to marry who would always produce a stunted and degenerate race.

Dr. John Strachan, of Dollar, referred to the great need of medical guidance in the matter of school procedure, holding that it should be the duty of the profession to safeguard the children in regard to the conditions of health of which schoolmasters were not required to have any knowledge. He thought that long confinement in school and at school work, amounting often to eight or nine hours of sedentary work, had a great tendency to deterioration of the physical condition and tendency to disease; and that the effect upon the nervous system of punishment and other terrorisms imposed upon children in connection with school lessons interfered with sleep and tended to injure the mind.

(To be Continued.)

## BOOK REVIEWS.

The Medical and Surgical Uses of Electricity. Including the X-Ray, Finsen Light, Vibratory Therapeutics, and High-frequency Currents. By A. D. Rockwell, A.M., M.D. New Edition. E. B. Treat & Co., New York.

The classical work of Beard and Rockwell appears in an entirely new and modern form in this new edition of Rockwell's, and to it are added a number of the modern applications of physical therapeutic measures.

The work has been received by the profession as one of the oldest and best, and we can add but little to former opinions expressed in the News.

The present edition brings the subject of the medical uses of electricity thoroughly to date.

Felix. A novel. By Robert Hitchens. Frederick A. Stokes Co., New York.

This is a fascinating tale of a phase of English life in which the development of a young boy of eighteen years of age is told with more than usual brilliancy and greater graphic truth than is usual in works of this type. But that is not the main feature of the book that renders it of absorbing interest to the physician. It is, in addition, a most thorough and careful study of morphinism as found in two women. The description, while in certain regards slightly overdrawn, is so well done that we venture to say that there is no work of fiction that deals with this question so well and thoroughly as this.

As a novel the work is absorbing, almost fascinating. As a study of the morphine habit it is entitled to scientific praise, and we recommend it to our readers most cordially.

The Autobiography of a Thief. Recorded by Hutchins Hapgood, author of Spirit of the Ghetto, etc. Fox, Duffield & Co., New York.

Accurate studies in criminology have heretofore been more conspicuous by their absence than by their presence in English literature. Josiah Flynt has happily laid the foundation of a sound literary handling in this field and many imitators have commenced to follow in his train. The present volume, however, should not be considered in the light of an imitation. It is, we believe, a truthful account of an ex-convict's life. A convict who, having been trained along other lines, might have been a useful citizen. As it was, he became successively a pickpocket, a porch climber, a robber, and a professional thief, who spent more than one-half of his life in prison. Apart from certain minor anachronisms the story is well told. The vernacular is carefully reproduced and the human side of the thief's life are brought out in an eminently sane and competent manner.

While it is too early to prophesy the reform of many of the characters of the under world, it is essential that as students of criminology we should carefully collect our facts and not attempt systems of reform or punishment on the metaphysical hypotheses that have heretofore characterized much of our so-called knowledge of criminal characters.

We cordially commend this work to all those interested in the study of this type of individuals.

# THE MEDICAL NEWS.

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## ORIGINAL ARTICLES.

### THE REDUCTION IN THE INFANT MORTALITY IN THE CITY OF NEW YORK AND THE AGENCIES WHICH HAVE BEEN INSTRUMENTAL IN BRINGING IT ABOUT.*

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THE infant mortality of any community is in a general way a good indication of the health of that community. A high general mortality is usually an evidence of a very high infant mortality. The infant mortality in all large communities is shockingly high, since from one-tenth to one-third of all infants die during the first year. That such an infant mortality is absolutely unnecessary is proven by the fact, that of babies born with good surroundings and properly cared for not one in a hundred die during the first year. It is manifestly impossible to give the tenement house babies all the care and luxuries that may be enjoyed by the wealthy but this is not necessary in order that they may be under such conditions as will materially reduce their death-rate.

TABLE NO. 1.

INFANT MORTALITY. DEATHS IN FIRST YEAR PER THOUSAND INFANTS.

| | |
|---|---|
| Norway and Sweden | 106.157 |
| England | 154. |
| France | 169. |
| Prussia | 217. |
| Italy | 220. |
| Hungary and Austria | 254.258 |
| Bavaria and Wurtemburg | 317.329 |
| United States in 1900 | 159. |
| New York City in 1902 | 158. |

In European countries, as is shown by Table No. 1, the infant mortality varies from 106 to 329 a thousand. In the United States according to the last census it was 159.3, while the cities of the country showed a mortality of 184.7. This was a marked improvement over the census of ten years before, 1890, since the total infant mortality of the country had decreased from 246.30 to 159.3 and that of cities from 303.86 to 184.7. In New York State the mortality in 1900 was 159, about the same as for the country and materially more than that of the cities of the United States. The mortality of colored infants is more than twice that of white infants. Thus in the last census it was 397.2 in cities as compared with 180.4 for white children.

The infant mortality of New York City has been very materially reduced in the past twelve years as is shown by Chart No. 1. The mortality from summer diarrhea in 1902 having been less than half what it was in 1892. Ten years ago the infant mortality of New York City was higher than that of many European countries while now our mortality of 158 is lower than that of most European countries and indeed than that of many smaller cities of this State, as shown by Table No. 2.

TABLE NO. 2.

INFANT MORTALITY IN NEW YORK STATE. DEATHS IN FIRST YEAR PER THOUSAND INFANTS IN 1900.

| | | | |
|---|---|---|---|
| New York State | 159. | Hudson | 200. |
| Kingston | 178. | Poughkeepsie | 202. |
| Auburn | 186. | Watertown | 219 |
| Binghamton | 197. | Troy | 229. |
| Albany | 199. | Lansingburg | 230. |
| | | New York City | 174. |

In view of this striking reduction in our infant mortality it is important that we should if possible ascertain what these agencies are that have brought it about. It may be asked, is the decline in mortality during the past ten years simply a part of a general decline which has been going on previously? I have not been able to get figures of the infant mortality of New York City before 1891, but have prepared a chart (No. 2) of the general mortality which shows no material decline in mortality between 1883 and 1891, so that this decline is due to influences operative during the past ten years.

An analysis of the figures from which the dotted, dashed and solid lines on Chart No. 1 were constructed, shows that the total infant mortality, represented by the solid line, has decreased from 242 to 158, or about two-thirds, while the deaths during June, July, August and September, represented by the dotted line, have decreased to somewhat more than half, thus showing a much greater reduction than the general infant mortality. The third class of deaths, from infantile diarrhea in summer, represented by the dashed line, however, shows the greatest diminution, the present death-rate being just one-half that of 1901 or 1902. The influences that have acted on the general infant mortality have acted largely through the mortality from summer diarrhea.

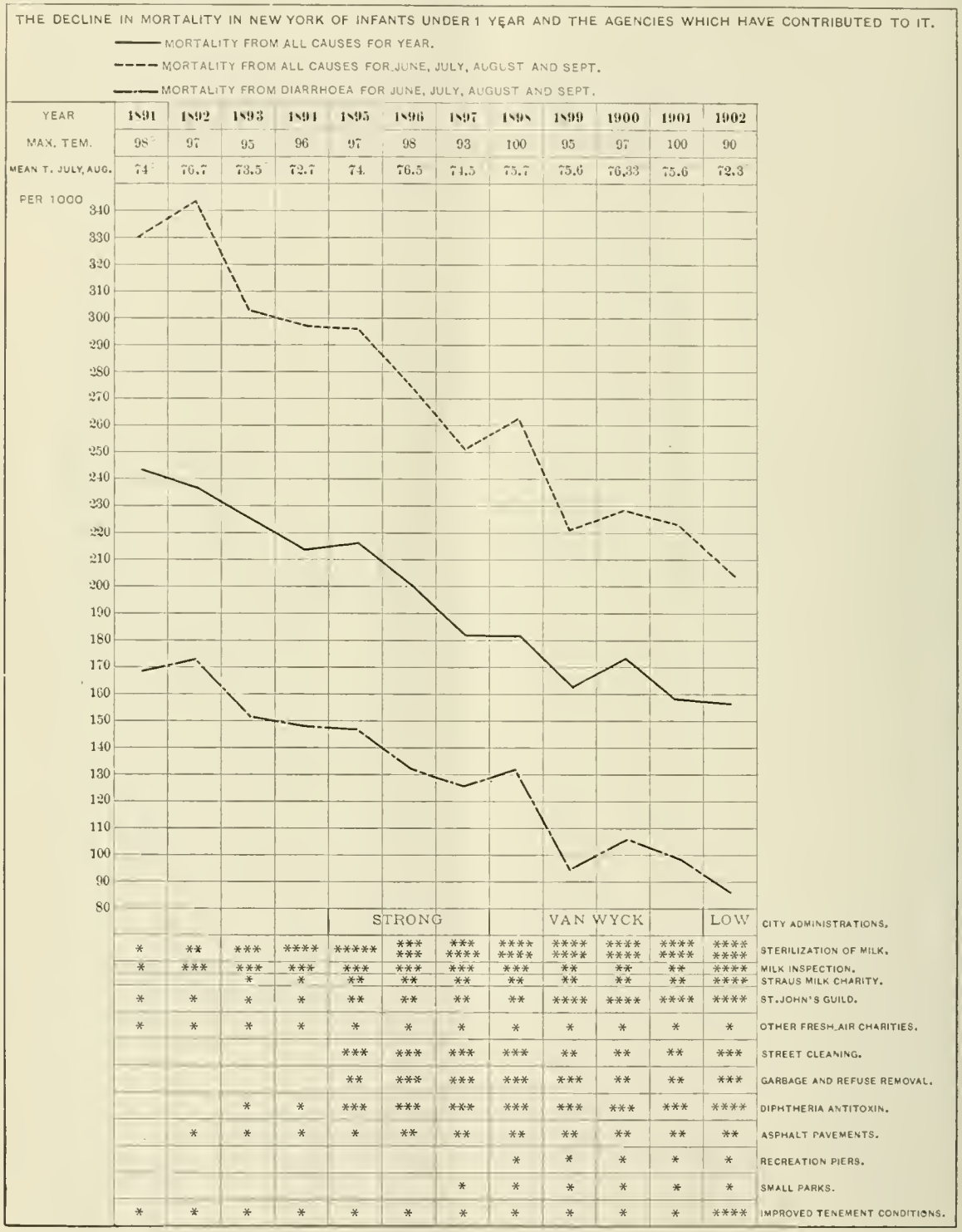
The causes of infant mortality and especially of summer diarrhea may be classified as: (1) Heat and humidity; (2) defective feeding; (3) bad surroundings. The increase in infant mortality in the summer over that in the cooler months is also shown well in the chart showing the infant mortality by months (No. 3). Thus with the beginning of warm weather in June the mortality increases, reaching its height in July and then rapidly falling in August. On studying

* Read before New York County Medical Society, April, 1903.

this chart we are likely to believe that this increased mortality is due to heat and humidity, but why do so few deaths occur in August when

ered and furnished to me through the courtesy of the Department of Health, shows graphically, daily observations of the number of

CHART NO. I.


THE DECLINE IN MORTALITY IN NEW YORK OF INFANTS UNDER 1 YEAR AND THE AGENCIES WHICH HAVE CONTRIBUTED TO IT.
MORTALITY FROM ALL CAUSES FOR YEAR.
MORTALITY FROM ALL CAUSES FOR JUNE, JULY, AUGUST AND SEPT.
MORTALITY FROM DIARRHOEA FOR JUNE, JULY, AUGUST AND SEPT.
YEAR 1891 1892 1893 1894 1895 1896 1897 1898 1899 1900 1901 1902
MAX. TEM. 98 97 95 96 97 98 93 100 95 97 100 90
MEAN T. JULY, AUG. 74 76.7 73.5 72.7 74. 76.5 74.5 75.7 75.6 76.33 75.6 72.3
PER 1000
340 330 320 310 300 290 280 270 260 250 240 230 220 210 200 190 180 170 160 150 140 130 120 110 100 90 80
STRONG
VAN WYCK
LOW
CITY ADMINISTRATIONS.
STERILIZATION OF MILK.
MILK INSPECTION.
STRAUS MILK CHARITY.
ST. JOHN'S GUILD.
OTHER FRESH AIR CHARITIES.
STREET CLEANING.
GARBAGE AND REFUSE REMOVAL.
DIPHTHERIA ANTITOXIN.
ASPHALT PAVEMENTS.
RECREATION PIERS.
SMALL PARKS.
IMPROVED TENEMENT CONDITIONS.

both of these conditions are usually pronounced? Do all the susceptible infants die in July?

Chart No. 4, constructed from data gath-

deaths from diarrhea, in New York City in children under two years (solid), the temperature (dotted), and humidity (dashed), during June,

July, August and September, 1902. There is evidently some relation shown between the dotted line, representing temperature, and the solid line, representing deaths, but it is not constant. It should, however, be noted that New York was singularly free from very hot weather during that season. No physician who has visited regularly, in summer, the wards of the babies' hospitals can doubt that heat and humidity have a serious effect on sick babies, a hot summer day usually showing a rise in the temperatures accompanied by an exacerbation of symptoms. While this is an important factor, there is a far more important factor in the food of the babies. Heat and humidity do the babies more harm indirectly by spoiling their food than by direct action on the child itself. This is well shown by the fact that babies that are given nothing but breast milk rarely suffer from diarrhea. It is also well indicated by the chart showing the mortality of certain European countries. For instance, where the babies are breast-fed, as in Norway and Sweden, the mortality is very low, while in Bavaria and Würtemberg, where they are mostly bottle-fed, the mortality is three times as high. Moreover, the babies of New York City fed on the Straus pasteurized milk have been found to do much better than those fed on ordinary milk. The third cause of infant mortality, bad surroundings, is significant. A hot, humid day out of doors is bad enough, but in the crowded tenements, with a fire burning in the kitchen of each apartment, the prostrating effect is much greater.

In view of the striking reduction in infant mortality, which has been referred to above and having considered these influences which contribute to the mortality, namely, heat and humidity, defective feeding and bad surroundings, we may now consider the various agencies which have been instrumental in reducing this mortality.

In considering these agencies we may assume that those which furnish to bottle-fed babies a better food than they formerly had are most important while those which improve the environments of the babies and give them fresh air are important contributory factors. In order to bring together these agencies in graphic form I have arranged a chart (No. 1), at the top of which I have noted the highest temperature of the summer as well as the mean temperature for July and August, and it is noteworthy that in these steadily descending mortality curves the abrupt rises are always associated with hot summers. Beneath this large chart I have noted the dates of the last three city administrations. The Strong administration by reforms in street clean-

CHART NO. 2.

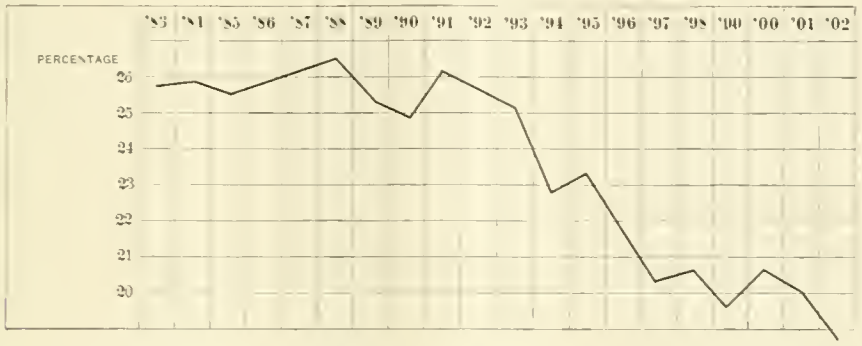



CHART NO. 3.

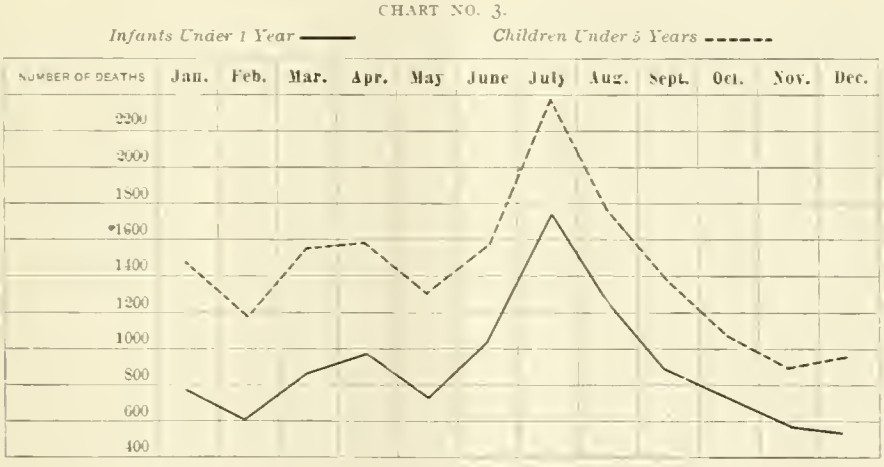
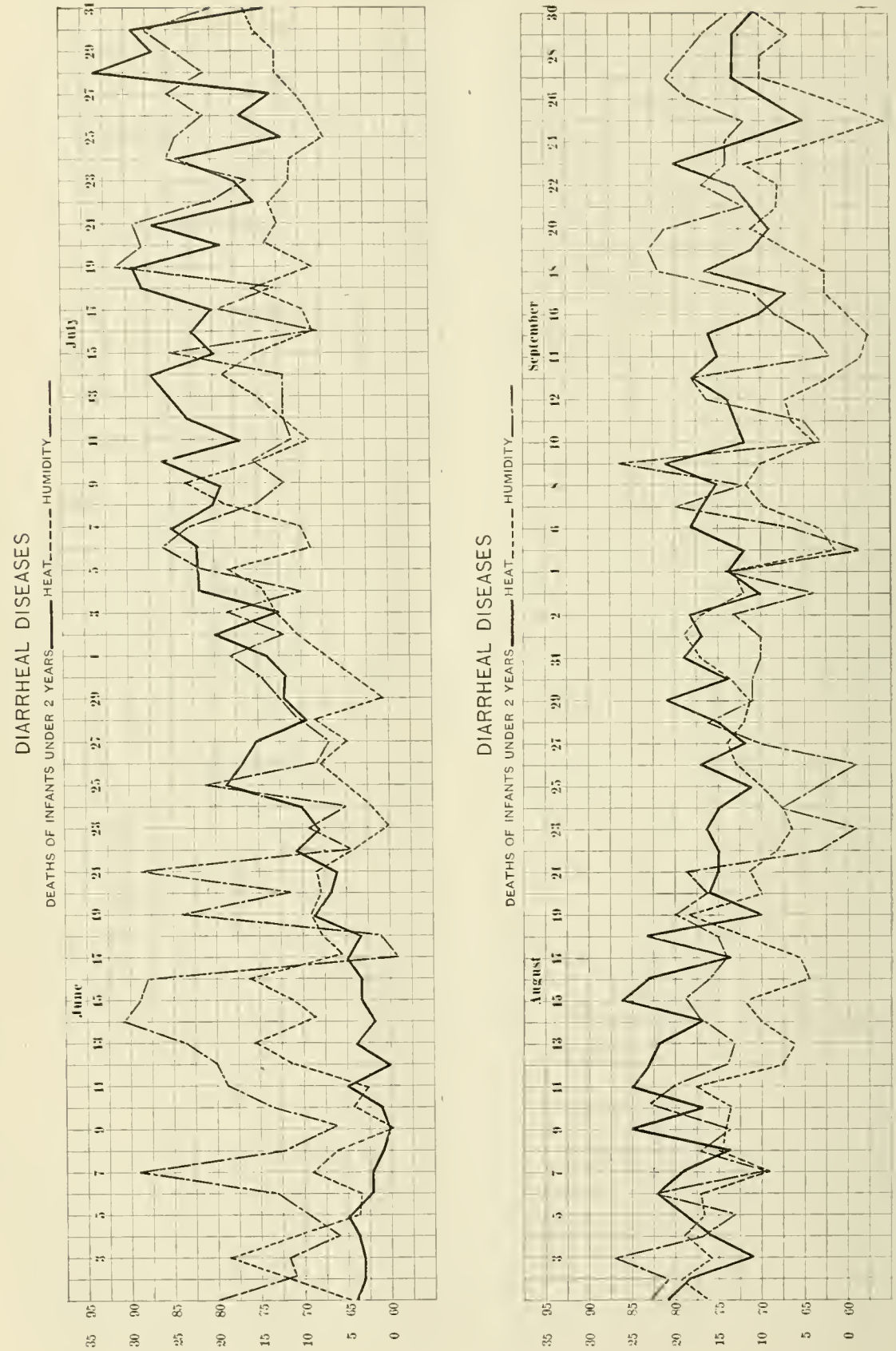


CHART NO. 4.


DIARRHEAL DISEASES
DEATHS OF INFANTS UNDER 2 YEARS
HEAT
HUMIDITY
June
July
August
September

ing, by an intelligent and energetic administration of the Health Deparment and by inaugurating a system of small parks, play grounds and recreation piers did much to secure the diminution in the death-rate during that administration and during the first two years of the Van Wyck administration.

The most important factor in reducing the infant mortality in New York is evidently not a local influence but one that applies throughout the country, for we have already seen that the infant mortality of the United States has been reduced during the past ten years in the same manner as that of New York. Thus, also, the report of the Board of Health of New Jersey for 1902 shows a marked falling off in the mortality of children under five years from 81.82 per thousand in 1892 to 40.23 in 1898. This reduction was evidently due to the sterilization and pasteurization of milk. It was at about the time that this diminution in infant mortality began that sterilization of milk in the tenements of New York City was generally adopted. So general has it now become that the inspectors of the Rockefeller Institute, when seeking statistics concerning the effect of different sorts of food on the health of babies in the tenements in summer, were able to find scarcely any that were fed on raw milk.

A definite example of the diminution in mortality from pasteurization of milk occurred in the Infants' Hospital on Randall's Island where the mortality in 1897 with raw milk was 44.36 while in 1898 with pasteurized milk it was 19.80. The importance of this factor cannot be too strongly emphasized at the present time when many physicians seem inclined to revert to raw milk.

The control of the city milk supply by the Board of Health may well be cited as an important factor in reducing infant mortality. Although the Board of Health had been active previously in its endeavor to secure good milk its exertions became much more vigorous in 1892, from which date a steady decline in the death rate ensued. It is also interesting to note that in 1899, 1900 and 1901, when there were fewer prosecutions for violations of the ordinances respecting pure milk, a slight increase in the death-rate is recorded while with largely increased activity in 1902, when there were 722 arrests and prosecutions of milk dealers, as compared with 464 in 1901, 460 in 1900, 193 in 1899, there was a diminution in the death-rate to the lowest point in the history of the city. I do not hold that these facts stand to each other absolutely in the relation of cause and effect but they afford at least a very interesting coincidence.

A second important agency in securing suitable nutriment to the bottle-fed babies is the Straus Milk Charity. Organized in 1893, the year in which the decline in death-rate began, with an output of 30,000 bottles it supplied in 1894, 300,000 bottles, in 1895, 600,000 bottles. The output then remained about the same until last year when milk certified by the Milk Commission of this Society was used by them and the demand reached 1,200,000 bottles, this enormous increase in distribution being accompanied by a diminution in infant mortality. New York City certainly owes to Nathan Straus a great debt of gratitude for inaugurating and carrying out, at his own expense, this most valuable aid to its tenement house babies. In connection with this may be mentioned the various commissions of medical men formed to improve the milk supply, which, by placing certain dairies under hygienic conditions, furnished an example to the ordinary dairyman and set a standard of pure milk.

The next agency in importance in the reduction of infant mortality seems to me the work of the St. John's Guild. This organization supports admirably equipped hospital-boats which make trips down the bay to the south shore of Staten Island where an excellent hospital receives the very sick cases. It was inaugurated in 1875 and furnished then three trips a week, it has, however, steadily extended its work and now supplies 12 trips a week, having two boats in service. This society thus takes away from 13,000 to 18,000 babies every summer and these are carefully fed and bathed during the trips. It is noticeable that the summer of 1899 when its activities were doubled by the services of a second hospital barge, the infant mortality dropped from 262 to 210 a thousand.

This is but one but by far the most complete and extensive of many organizations working in New York City with much the same end in view, such as the Association for Improving the Condition of the Poor, The Children's Aid Society, The Sanitarium for Hebrew Children and the *Tribune* Fresh Air Fund. Altogether probably 35,000 infants are thus taken out of New York City during the hot months of July and August.

A factor of no little importance in diminishing our infant mortality was the appointment by Mayor Strong of Col. Waring as Street Cleaning Commissioner in 1895. He not only cleaned the streets but showed how it should be done. The prompt removal of garbage and refuse under the Strong administration aided in keeping the tenement districts healthful.

The development of diphtheria antitoxin in 1893 and its manufacture and free distribution among the poor by our Board of Health since 1895 which has reduced the mortality from this disease from 40 per cent. to 10 per cent., has diminished infant mortality, especially in the hospitals for infants where prophylactic injections of antitoxin are used.

The gradual paving of our streets with asphalt in place of the stone blocks has made them easier to keep clean and thus added to the healthfulness of the city. This was begun on an extensive scale in 1890 and in 1892 a number of streets on the lower East side were thus improved. During the last year of the Strong adminstration 1897, more streets were asphalted than ever before. Two-thirds of our asphalt pavements have been laid in the past five years.

The opening up of small parks in the crowded

districts, by the destruction of tenements, began with the Mulberry Bend Park in 1897, the opening of playgrounds for children, through the efforts of the Outdoor Recreation League, began in 1898 and the establishing of the six Recreation Piers beginning with that at East Third Street in 1898, have all helped the babies to obtain fresh and cool air during the summer.

One more influence, the condition of the tenements, is an important one. Overcrowding has for many years been controlled by the Health Department but it was not until the Gilder Tenement House Commission of 1894 began its labors that the evil conditions were generally appreciated. Soon the results of our new tenement house laws and their enforcement by the Tenement House Department should be accompanied by a still lower infant mortality.

In conclusion the following summary may be presented: (1) The infant mortality of all countries is shockingly high and this is shown to be unnecessary by the fact that infants that are well cared for show a very low mortality. (2) The influences that contribute to the high mortality are defective feeding, the active cause, and heat and humidity and bad surroundings as contributory causes. (3) There has been a marked decline in infant mortality during the last ten years in the United States and especially in New York City, due, for the most part, to the decline in mortality from summer diarrhea. (4) This striking decline in infant mortality is due to many agencies. The general adoption of pasteurization and sterilization of milk for infant feeding is by far the most important of these and applies to New York City and the whole of the United States. Other agencies in New York City are the improved city administration, the milk inspection of the Department of Health, the Straus Milk Charity, the fresh air work of St. John's Guild and similar charities, cleaner streets and asphalt pavements, the new small parks, playgrounds and recreation piers, the improved tenements and the use of diphtheria antitoxin.

## NEGLECTED PROPHYLACTIC MEASURES AGAINST DISEASES OF THE RESPIRATORY TRACT.*

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It is not my purpose to speak of all the neglected prophylactic measures against diseases of the respiratory tract. I desire merely to emphasize several of the directions in which our efforts of prophylaxis fall lamentably short of our present-day knowledge of the subject.

The first of the points to which I wish to invite your attention is the detrimental influence of dust of whatever kind in causing irritation of the mucous membrane of the respiratory tract, thus paving the way for subsequent infection. It is an accepted fact that different kinds of dust operate in this manner, and yet there is no intelligent effort made to abate the evil wherever possible. In many industrial pursuits it is well known that the dust-laden atmosphere of the establishment is the primary cause of the prevalence of diseases of the respiratory tract, especially tuberculosis, among the operators. Modern improvements in machinery have done a great deal toward ameliorating the evil, but these alone are insufficient to overcome the detrimental influence of the dust.

In discussing a subject such as this I am well aware that I am going outside the domain of pure medicine into that of Social Hygiene, but I earnestly believe that the medical profession must first be aroused to a sense of the importance of the subject before it will be possible to reach the ears of the industrial world.

Our efforts at ameliorating the evils of this nature, besides insisting upon the introduction of machinery designed to limit the production and to assist in the abstraction of dust from the establishment, should be directed toward regulating the hours of employment in such establishments. Röpke (*Centralblatt f. allgem. Gesundheitspflege*, 1900, Sonder-abdruck), in a comparative study of the prevalence of diseases of the respiratory tract in the metal grinders of Solingen, Germany, and those of Sheffield, England, shows that in spite of the fact that the establishments at Sheffield are far less satisfactory and the arrangements for the removal of dust are poorer than at Solingen, the workmen at Sheffield present better health statistics. These results he attributes to the fact that at Sheffield the workmen are more generally abstainers, engage in athletic sports, live in better houses, and assume a better position at their work. The influence of prolonged sojourn in the open air, associated with athletic sports, is, no doubt, one of the principal factors in bringing about the better conditions of health among the Sheffield grinders. Lack of detailed study in this particular prevents us from making more than general statements upon this point.

Many other industrial pursuits are attended with the production of dust, and observation has shown that the prevalence of diseases of the respiratory tract is far more pronounced among those following such occupations than in those who engage in pursuits unattended by dust formation. Our knowledge of the great hygienic value of pure air as a prophylactic agent against disease suggests one of the most efficient modes of combating the detrimental influences of the dust in such occupations. If we can secure for workmen of this class a shorter working day, and at the same time encourage them in devoting the greater part of their leisure to outdoor exercise, we place them in a better position to overcome the injurious effects of the dust inhaled during their working hours.

Another form of dust which has become a menace to our lives in recent years is that generated in the streets in the larger cities. Since the advent of electric cars and smooth pavements the lives

*Presented to the American Climatological Association, May 14, 1903.

of the inhabitants of cities have been made miserable by the volumes of dust which are constantly formed on the streets. There is no doubt that this modern condition of city streets influences the apparently greater prevalence of diseases of the respiratory tract in recent years. It not only favors the more general dissemination of the specific micro-organisms but it also serves to lower the vitality of the mucous membranes of the respiratory tract and thus facilitates the invasion of these tissues by the bacteria when inhaled subsequently.

The remedies that may be suggested to abate this evil are not very satisfactory, though they may be made effectual to a certain degree. The efforts of the street cleaning departments are evidently too spasmodic to accomplish all that could be accomplished. More efficient cleaning of the streets at a time when they are practically unoccupied—the early morning hours—and the systematic flushing of the pavements will assist in minimizing the evil. Let us hope that in addition to a more efficient street cleaning we may, in the not far distant future, see all lines of transportation placed underneath or above the streets and the employment of draught horses superseded by other, non-dust-producing modes of propulsion.

The second point to which I wish to direct your attention is the great deficiency in the ventilation of so many of our public schools. It is a well-known fact that the constant breathing of air markedly vitiated by the excretions from the lungs of other persons exerts a detrimental influence upon the vital powers of the system. Nevertheless we find many of our public school buildings overcrowded and in consequence the way is opened for the more general distribution of the micro-organisms of disease when brought into such an overcrowded space.

The greater prevalence of such diseases as diphtheria, measles, and scarlatina during the autumn months can be definitely traced to the very intimate association of children in overcrowded and poorly ventilated school-rooms, and to the diminished resistance of their bodies to infection in consequence of the injurious effects of such overcrowding.

We have a general knowledge of the overcrowded condition of the public schools in different places, but, so far as I know, no systematic effort has been made to gather detailed information regarding the ventilation of the public schools except that just published by the State Board of Health of Ohio (1901) for all the schools in cities and towns of that State. This report is most interesting and important, and should be duplicated elsewhere. The tables given in this report show the number of square feet of floor space and the air space for each pupil in a room, as well as the ratio of window area to floor space. The investigation shows that 18 per cent. of the schools contain one or more rooms that fall below the minimum standard of 15 square feet of floor space, and a still greater number (28 per cent.) fall below the minimum standard of 200 cubic feet of air space, while 75 per cent. of the school buildings have rooms that are deficient in light in that they fall below the standard of a window area of 20 per cent. of that of the floor space.

Conditions such as these are, no doubt, very general throughout the country, since there is no probability that the conditions are worse in Ohio than elsewhere. With conditions such as these prevailing in our public schools it is no wonder that diseases of the respiratory tract are so readily disseminated amongst school children. Moreover, deficient ventilation and lighting are potent agencies in undermining the vitality of the bodies of growing children. It is of the greatest importance that the children of our public schools be protected from all detrimental agencies possible.

Among the prophylactic measures against diseases of the respiratory tract the two measures which appear to require our most urgent attention are the prevention of the formation of dust and the regulation of deficiency in ventilation and lighting of our public schools. The neglect of enforcement of sanitary laws in these two particulars is, no doubt, the cause for untold suffering. The regulation of sanitary questions of the magnitude of the ones under discussion must necessarily fall upon the State. The educated physician can do much, however, in creating public sentiment and directing it into proper channels of action.

## PUERPERAL INSANITY.*

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Puerperal insanity is a generic term used to include all cases of mental derangement incident to pregnancy and its sequelæ. When we remember the marked perturbation of the nervous system, even in some cases of pubescence, adolescence or climacteric periods, much less normal pregnancy, from reflex causes, from disorders of digestion and from the depravation of the blood, it is not strange that the same conditions which give rise to moral perverseness, to the loss of memory, to hysteria, or hypochondriasis should likewise prepare the way for the outbreak of the more pronounced forms of mental derangement.

I shall not dwell on the symptoms and differential diagnosis of mania and melancholia, per se, but shall speak of the relations of insanity mostly incident to pregnancy and its sequelæ, because it is too tiresome to treat of them here when we can find an exhaustive description of them in any standard work on insanity.

Puerperal insanity is conveniently subdivided into three classes: (1) Insanity of pregnancy, which is usually melancholia; (2) puerperal insanity proper, which comes on in a limited period after delivery and is usually in the form of mania, and (3) insanity of lactation, which is mostly melancholia.

* Read before the Medical Ass'n of Georgia, at Columbus, Ga.

The form of puerperal insanity may be mania, or melancholia, and sometimes these forms pass into dementia. Mania is almost always the form of insanity that occurs in puerperal insanity proper; melancholia is the form generally met with in the first and third classes, and if dementia occurs it is usually in these classes. Mania occurs more frequently than the others. The percentage of the different classes are: Insanity of pregnancy, 20 per cent.; puerperal insanity proper, 50 per cent. and insanity of lactation, 30 per cent.

Extensive collected statistics from various institutions devoted to the treatment of insanity claim that 7.1 per cent. of all cases of insanity of females are of puerperal origin, and that the disease develops during the child-bearing process.

As to the frequency of puerperal insanity in relation to the number of cases confined writers and present statistics vary considerably. My experience in the lying-in hospitals and insane asylums while in Baltimore and since I have been practising medicine, prove that we seldom meet with a case of puerperal insanity, although I met with two cases in 1902 and one in 1903. Summing up the tabulated cases of the best authors and writers and from latest statistics, it is sufficient to say that one woman out of every four hundred who is confined becomes insane. Dr. Williams, at Johns Hopkins, claims that the proportion is one out of 650.

There is a form of insanity not considered in the other classes known as transient mania during delivery. This is a peculiar form of mental derangement sometimes observed during labor and called temporary insanity. It is more accurately described as a kind of acute delirium, produced in the latter stages of labor by the intensity of the suffering caused by pains. It is most apt to occur as the head is passing through the os uteri, or at a later period, during the expulsion of the child. It may consist of merely a loss of control over the mind, during which the patient, unless carefully watched, might in her agony seriously injure herself or her child. Sometimes it produces acute hallucinations, as in the case described by Tarnier, in which the patient fancied she saw a specter standing at the foot of the bed, which she made violent efforts to drive away. This kind of mania, if it may be so called, is merely transitory in its character and disappears as soon as the labor is over. From a medicolegal point of view it may be of importance, as it has been held by some that in certain cases of infanticide the mother has destroyed the child when in this state of transient frenzy and when she was irresponsible for her acts. In the treatment of this variety of delirium one must of course try to lessen the intensity of the suffering, and it is in such cases that chloroform should be administered. After this temporary insanity passes off, we should keep the patient quiet for some time.

*Class* 1.—Insanity of pregnancy is without doubt the least of all three forms. The intense mental depression, which in many women accompanies pregnancy, and causes the patient to take a despondent view of her condition, and to look forward to the result of her labor with the most gloomy apprehension, seems often to be only a lesser degree of the actual mental derangement which is occasionally met. In many the attack of insanity can be traced as developing itself out of the ordinary hypochondriasis of pregnancy. A larger proportion of cases occurs in primiparæ than in multiparæ, a fact no doubt that depends on the greater dread and apprehension experienced by women who are pregnant for the first time, especially if not young. The period of pregnancy at which mental derangement shows itself varies. Most generally it is at the end of the third or the beginning of the fourth month.

We should not confound aggravated hypochondriasis with insanity of pregnancy as the former usually lessens after the third month, while the latter only begins after that date. Melancholia in insanity of pregnancy does not differ much from ordinary melancholia, although the suicidal tendency is often strongly and very generally developed, and moral perversions are not uncommonly observed.

Sometimes there is a tendency to dipsomania in the early months, which may be an exaggeration of the depraved appetite or morbid cravings, so commonly observed in pregnant women, just as melancholia may be a further development of lowness of spirit. Sometimes kleptomania is very characteristic of the disease.

*Prognosis.*—The prognosis may be said to be, on the whole, favorable, although there is little hope of a cure until after the termination of pregnancy.

*Causes.*—By far the most prolific cause of insanity of pregnancy is an hereditary predisposition to insanity that exists, and the event of pregnancy acting simply as the spark that fires the mine. The morbid dread of pregnancy aids in its causation. Besides hereditary predispositions there are other neuroses that have important influence in the causation, such as family history of epilepsy, drunkenness or hysteria. Anemia, which comes on gradually, has an effect in producing it.

The most recent theories show and claim that toxemia of pregnancy or a manifestation of autointoxication play an important part and claim that the toxemia is caused by toxins produced in the bodies of mother and child, and retained because of a lack of excretion or by incomplete metabolism or by both. These toxins may be the result of chemical decomposition of food and the waste material of tissue change largely increased by pregnancy. The insanity may be caused by an as yet unknown group of toxins which may exist in the body during the period of gestation.

*Puerperal Insanity Proper.*—True puerperal insanity has always attracted much attention from obstetricians, often to the exclusion of other forms of mental disturbance connected with the puerperal state. Puerperal insanity proper is the most interesting part of the subject. We may define it to be that form of insanity which comes

on within a limited period after delivery, and which is intimately connected with that period, because the mental disturbance which is usually acute confusional insanity is due to toxemic infection. Mania is generally the form of insanity met with, but by no means is it the only kind of insanity observed, for there are a considerable number, being well-marked examples of melancholia. There are also some peculiarities as to the period at which these varieties of insanity show themselves, which, taken into consideration and in connection with certain facts in their etiology, justify us in drawing a closer line of demarkation between them. My experience and the authority of the best writers lead me to say that all cases of acute mania come on within eight days after delivery and that all cases of melancholia develop after that period.

*Etiology.*—It is pretty generally admitted by all alienist physicians that hereditary tendencies form one of the strongest predisposing causes of mental disturbance in the puerperal state. In a large proportion of cases circumstances producing debility and exhaustion or mental depression have preceded the attack. Preceded by post-partum hemorrhage, severe and complicated labor, or they may have been weakened by over-frequent pregnancies, or by lactation during the early months of pregnancy. Morbid dread during pregnancy is sufficient to produce insanity before delivery, may develop into puerperal insanity after labor.

Shame and fear of exposure in unmarried women not infrequently lead to the disease. The anemia produced by post-partum hemorrhage is a potent factor in producing puerperal insanity. Mental impressions may be the determining cause in predisposed persons. The age of the patient has some influence and there seems to be a greater liability, at advanced ages especially, when such women are pregnant for the first time. The symptoms are intensified by disturbances of the abdominal or pelvic organs. The most recent theories and investigations attribute the causation of the disease to some morbid condition of the blood. The possibility and probability of an acute form of puerperal insanity, coming on shortly after delivery, being dependent on some form of septicemia is one that deserves most careful consideration and investigation on this subject.

There are several theories advanced as to the dependence of the disease being due to a morbid condition of the blood. The theory of uremic blood-poisoning causing puerperal insanity was originated by Sir James Simpson and supported by Dr. Donkin, who, after finding albumin in the urine of several patients, claimed that it might properly indicate the presence in the blood of certain urinary constituents which might have determined the attack, much in the same way as in eclampsia; that the acute dangerous class of cases are examples of uremic blood-poisoning of which the mania, rapid pulse, and other constitutional symptoms are merely the phenomena, and that the affection therefore, should be termed uremic, or renal puerperal mania in contradistinction to the other forms of the disease. They also claim that the immediate poisoning may be carbonate of ammonia, resulting from the decomposition of urea retained in the blood. The theory that hepatic insufficiency causes puerperal insanity originated and is supported by Budin, Penard and Dorland. Dorland claims that puerperal insanity is due to hepatic insufficiency and that the kidneys are only secondarily affected and that the morbid condition of toxic properties of the blood is not a disease of the kidneys or insufficiency of their functions. The tendency to-day is to ascribe the morbid condition of the blood and albuminuria to one and the same cause, namely, the presence in the blood of a certain toxin of unknown origin and constitution. The frequency of marked hepatic lesions in autopsies on puerperal women points to the probability of the toxin being liberated in the liver. Puerperal infection or toxemic infection is the direct cause of puerperal insanity, based on the fact that puerperal insanity occurs in the great majority of cases within the first ten days after delivery, the same period during which puerperal infection usually occurs. It is generally accompanied by elevation of temperature and other evidences of febrile disease. The clinical form in which puerperal insanity manifests itself is in most of cases that of acute delirious or confusional mania, closely resembling febrile delirium. The death-rate is much higher than in simple mania, death occurring from exhaustion usually with high temperature and rapid pulse. Post-mortem examinations, although apparently infrequent in either case, have shown grave involvement of the pelvic organs. Examinations of the pelvic organs during life show lacerations of the perineum and cervix uteri, which are the channels of infection in the puerperal woman. Puerperal insanity was a common complication of the puerperium in former times, but since the introduction of aseptic methods in midwifery there is a reduction of one-half of its incidence. Sometimes there are secondary conditions found, such as intrapelvic inflammations and consequent abnormal locations, fixations and congestion of the uterus, tubes and ovaries. It should be borne in mind that in each individual case many factors are indissolubly associated, the patient's mental breakdown being the result of several complex conditions, each reacting upon and intensifying the other. I think that the renal and hepatic theories are fallacies, although they may have some weight in producing the disease, because effects of faulty elimination of secretion altered in quantity and quality play an important rôle in the production of the unstable nervous condition of pregnant women. So we find the liver unable to perform the work thrust upon it and failure of skin and kidneys, with or without albuminuria, all of which certainly can and do induce faulty nutrition of the brain. There are many facts, as statistics of recent years show, to support the

belief that I have advocated that sepsis is by far the most important cause of puerperal forms of insanity. But it is strange that no one has yet ventured to assert that all puerperal cases are due to intoxication from either bacteria, or toxemic organ compound. In short, I venture to say that the *hereditary taint and morbid predisposition are the true causes of the disease, the puerperal condition being its immediate and exciting cause.*

Recent advances in bacteriology warrant the opinion that some day proof will be abundant of the universal belief that either toxemic or septic infection is a primary factor in all cases of psychosis of childbirth.

In no class of cases are gynecological investigations of more importance than in the study of the causation of puerperal insanity.

*Diagnosis.*—The diagnosis of puerperal insanity, cannot be made out from the symptoms. It is not a special variety of insanity symptomatically, but etiologically.

*Prognosis.*—The prognosis is favorable; 75 to 80 per cent. recover, but a large proportion die of exhaustion. In no class of cases of insanity is the prognosis so favorable as those of puerperal origin. The number of previous pregnancies seems to have little influence, but the age seems of more importance. The younger the patient, the better apparently is the prognosis. The disease may resolve itself into a consideration of immediate risk to life and of the chances of ultimate restoration of the mental faculties. It is an old aphorism, "That mania is more dangerous to life and melancholia to reason." Extreme rapidity of the pulse is indicative of a fatal tendency. If pulse be 120, conditions are grave, but as long as the pulse remains below 100 there is no immediate danger. Should there be development of phlegmasia dolens, the prognosis is rendered exceedingly grave. The most dangerous class of cases are those attended with some inflammatory complication with marked elevation of the temperature.

*Duration.*—The duration of the disease varies considerably; patients usually getting well in three months; but melancholia generally lasts longer than mania. When the patient gets well, it often happens that her recollection of the events occurring during her illness is lost; at other times the delusions from which she suffered remain.

*Lactational Insanity.*—This is a mental disturbance occurring during the period of lactation, usually coming on from six weeks to ten months after labor. This form of insanity is generally melancholia, and occasionally you meet with confusional insanity, which is much more transient than true puerperal insanity. There seems, however, to be more risk of the insanity becoming permanent than in other forms. Sometimes the melancholia degenerates into dementia and the patient becomes hopelessly insane.

*Etiology.*—Heredity taint is an important factor in producing this form of insanity as in the other forms. Prolonged or excessive lactation is considered the chief cause in producing lactational insanity. Careful inquiry, however, shows that certain conditions favoring toxemic infection are often present, as a mammitis, or mammary abscess sometimes precedes the mental disturbance. Defective uterine involution is considered as a factor. Lacerated cervix and endometritis have been found present in some cases. Its dependence on causes producing anemia and exhaustion plays an important part. Retained placenta, I believe, has force in producing it, as in a case of lactational insanity which I treated I found patient with discharge and retained placenta six weeks after labor. The toxemic effects from the retained placenta in this case giving rise to slight febrile condition proves that toxemic conditions are important factors in causing lactational insanity.

*Diagnosis.*—The occurrence of confusional insanity during the nursing period is the only diagnostic feature. There is nothing distinctive in the symptomatology. Three to four per cent. of all cases of insanity in women occurs during the nursing period.

*Prognosis.*—The prognosis is moderately favorable, from 40 to 50 per cent. recover. The danger to life is not great if the cause producing debility be recognized and at once removed.

*Mania and Melancholia.*—The symptoms of these forms of insanity are practically the same as in the non-pregnant state, consequently I will dwell only on the symptoms peculiar and incident to puerperal insanity, for you can find very extensive descriptions of the symptoms in almost any standard work on insanity. Mania is more frequent than melancholia, and occurs generally in puerperal insanity proper. This disease usually comes on in the first week of the lying-in period. It is almost in all, if not in all cases related to certain well-known symptoms of puerperal sepsis, fever nearly always being present. There may be prodromal symptoms, although they usually are not well marked. These consist in either depression, irritability or emotional instability. The outbreak usually begins with excitement, rapidly ending in incoherence. The usual feelings are proverbial. The patient may have attacks of violence, during which attempts are made on the life of the husband, the newly-born babe, or other children, if any.

These symptoms often have a religious basis; at other times they are based on delusions of jealousy. Usually the hallucinations and delusions of the patient are of a sexual nature and character. The most refined women will surpass the imagination of the most degraded in their obscenity and vulgarity of language and actions. The eyes are bright and face pallid, pulse quick, tongue dry and furred, bowels mostly constipated, urine high colored and scanty and appetite uncertain and abnormal, attempting to eat bedclothes, etc.; they also try to inflict bodily injuries on themselves, gouging at their eyes, etc. They seem dissatisfied with their physicians and nurses. They will often yield to suggestions and treatment of the physician on his first visit but

no longer, and then beg for new physicians. I experienced this in treating one case in which the patient became dissatisfied and refused to follow any of my suggestions or take a dose of my medicine. Another physician was called in, after his first visit he was treated likewise and the third physician was called, and after his first visit he received like treatment. Motor excitement is common. Some desire to remove their clothing and expose their persons while in others it is perhaps due to hallucinations of common sensation, rendering the weight or pressure of the clothing unbearable. The patient gets apathetic; there may be alternations of excitement and depression with incoherence as a dominant symptom, lasting for years. It may end in secondary dementia.

*Melancholia.*—This disease is most commonly in uterogestation and lactational insanity, and is often preceded by cephalalgia, tinnitus aurium, and flashes of light before the eyes, and other indications of debility when it comes on during lactation. But when during uterogestation, the accompanying delusions are generally exaggerations of the anxieties and whims of pregnancy. The advent of melancholia is more gradual. It may commence with depression of spirit without any adequate cause, associated with insomnia, disturbed digestion, headache and other indications of bodily derangement. Such symptoms, showing themselves in women who have been nursing for some length of time, or in whom any other evident cause of exhaustion exists, should never pass unnoticed. Soon the signs of mental depression increase and positive delusions show themselves. These may vary much in their amount, but they are all more or less of the same type, and very often of a religious character. I had one case in which insanity began and ended with religious delusions and hallucinations. The amount of constitutional disturbance varies much. In some cases, which resemble in character those of mania, there is considerable excitement, rapid pulse, furred tongue and much restlessness. Acute cases of melancholia coming on during puerperal state most often assume this form. In others there are less of these general symptoms; the patient sits for hours without speaking or moving; but there is not much excitement and this is the form most characteristic of insanity of lactation. There is always a strong tendency to suicide; which should never be forgotten in melancholia cases, as this may develop in an instant, and that a moment's carelessness on the part of the attendant may lead to disastrous results.

*Treatment.*—I will give the treatment of mania and melancholia mostly relative to puerperal origin, as we can find a descriptive treatment in nearly every work on insanity for general mania and melancholia. The indications for treatment are to check profuse, exhausting discharge; to support the patient's strength and to insure perfect quiet. With the first signs of trouble the child should be taken from its mother's breast and sight; liquid food should be given at frequent intervals, care should be taken to keep the rectum and bladder empty, the room should be darkened and its temperature should be regulated. We must calm the excitement and give rest to the brain. In acute mania there are three important things to do: The patient must have a sufficient quantity of suitable food and sleep; we must seek and remove the cause, bearing in mind that puerperal insanity is an infectious psychosis, the local source of infection should be sought out and removed, if possible. In some cases there is simple sapremia due to absorption of septic material from the birth canal. In others there is septicemia. In short, the treatment is about the same as in any case of puerperal infection. The streptococcic serum and intravenous infusion of formalin are used and have proved to be of no benefit, so far. In cases of purulent endometritis or retained placenta, curetting of the interior of the uterus and repeated irrigations will be required. Persons not needed in the sick-room should be excluded.

If the patient is poor and strength will warrant it, she will be best cared for in an asylum. Whenever possible, patient should be treated at home with trained nurses and much of our success in treatment depends on the nurses and especially their experience with the insane. We should have day and night nurses. The fact of having been in an asylum fixes a certain stigma upon patients, so let even this make us conservative in our orders. Every endeavor should be made to induce the patient to take plenty of nourishment to remedy the defects of the excessive waste of tissue and support her strength until the disease abates. If there is no febrile condition, give solid food as long as is possible, but if any febrile condition is present give only liquid food, as it will be better. Give the liquid food frequently and in small quantities. If patient refuses to take food, give it to them forcibly. Alcoholic stimulants should be given to the fullest extent, when well borne. In the early stages, or in mania, or in the excitant stages of melancholia the patient is better off without these stimulants, but under other circumstances they are to be given. At the onset a good purgation is beneficial, after that purgatives are harmful, but the liver and bowels should be kept in good condition by giving mild laxatives, such as a few grains of calomel, cascara sagrada, or sodium phosphate. When a diuretic is indicated give potassium acetate and infusion digitalis. If the skin is harsh and dry daily sponging with alcohol and warm water is very beneficial and it will aid to calm the excitement of patient. The heart should be watched and its strength maintained by small and repeated doses of digitalis, so as to keep the brain well nourished. Opiates should not be given unless in severe pain, as in cellulitis, as they have adverse action on the secretions. To produce sleep and calm the patient, which necessarily forms one of the most important points in treatment, of all remedies chloral hydrate stands first, and given

with potassium bromide its hypnotic action is increased. Trional is a very reliable drug for maniacal excitement and insomnia when given in doses of 30 grs. every two to four hours, to produce sleep and quiet the patient, but heart and bowels must be watched. I have found nothing to control the excitement better than hyoscine hydrobromate, given hypodermically in dose from $^1/_{150}$ to $^1/_{60}$, repeated once or twice daily, watching its effects. When the patient reaches convalescence she should have a good tonic, change of air and scenery and be taken to a healthy and quiet location. Great care should be exercised in allowing the visits of relatives and friends. There should be secured for the patient, rest, sleep, nutritious food, daily evacuation of the bowels, and little by little she should be brought back once more to old habits and the responsibilities of existence.

## THE ADAPTABILITY OF WESTERN TEXAS CLIMATE FOR THE TREATMENT OF CONSUMPTIVES.

BY C. H. WILKINSON, M.D.,
OF GALVESTON, TEXAS.

Desirous of adding my quota of experience to a cause which I consider more worthy of consideration than any other before the medical profession of our country to-day, namely, the proper caring for our American consumptives, and believing that my many years of observation upon the subject have borne some practical results, so far as benefiting these cases is concerned, I submit this article, trusting that it may fall before the eyes of some who may be thereby guided to a climate which certainly will be beneficial to all who resort to it in the early stage of phthisis.

It might be well to premise my remarks by the broad assertion that there is to-day, probably, no known specific for consumption. A victim once enlisted in the army of the Great White Plague has a battle to fight which almost invariably ends in his defeat, if he trusts alone for his cure to medicine. No reliance, therefore, can be placed in "vaunted cures," nor in any of the horde of "boasted methods" that flaunt from the columns of our American papers every day.

Not that medicine, however, is useless in consumption; on the contrary, at certain times and under certain conditions it is useful as an auxiliary to more natural and important methods of dealing with this disorder, and he who attempts to steer his cases through consumption, without the occasional aid of medicine, commits an error.

Turning away then in search of relief, from our Pharmacopeia, and from an exclusive medical system of treatment for such cases the important question which confronts us at the outset of our efforts is, What are we to do with these cases? Fortunately, nature has placed within our reach, and right at our doors, and practically accessible to all, a drugless remedy which answers the question and which can be relied upon, if taken in time, for the cure of human tuberculosis. That drugless remedy is climate.

*Western Texas.*—Without consuming space upon the climates of New Mexico, Arizona and Colorado, the three most famous territories in America, and justly so, for the relief of consumptives, or upon other less favored localities, the writer simply desires to introduce his adopted State to the consideration of the medical profession of this country, with the sole object in view of pressing her claim for recognition as one of the most favored spots on earth, for the sure and prompt eradication of phthisis pulmonalis, if such cases take advantage of her climate in the early stage of that disease. Western Texas, that portion of the great Lone Star State especially adapted for the cure of phthisis, and of which this article is particularly descriptive, comprises all that territory situated between the Colorado River on the east, and the Rio Grande on the west; the thirty-second parallel of north latitude on the north, and the Gulf of Mexico on the south. In extent it is larger than all New England, and is easily capable of accommodating over 10,000,000 human inhabitants.

The surface of this country is mainly undulating, except along its southern boundary, which is level, and rises from an elevation of 500 feet in the east to one of 5,000 feet or higher, along its western border. Within the limits of the country just described, it is safe to say, can be found the natural sanitarium of the world. The winters here are comparatively short and mild, while the summer heat rarely if ever attains a degree to be oppressive, and summer nights are always cool and delightful.

Three or four important lines of railroads traverse Western Texas, so that most portions of the country can easily be reached by health seekers, and along these lines the luxuries of life can nearly always be found, if proper effort is made to procure them. Moreover an abundance of pure water can readily be obtained, as likewise an abundance of nutritious foods.

Cities, towns and villages, to the number of a hundred or more, are interspersed all through this region, and the residents thereof are, in the main, quiet, peaceable and intelligent. A few years ago nearly all of Western Texas was one vast cattle ranch, or, more correctly speaking, a continuous line of them; but to-day most of these pastures have been converted into beautiful farms, while the cowboy and the Indian have retreated before the school teacher and the industrious farmer.

*The Climate.*—As stated above, the winters and summers of Western Texas are comparatively mild, the degrees of heat and cold never attaining the extremes observed in many other localities resorted to by health seekers, consequently invalids are enabled to be in the open air for a longer period of time than perhaps in any other State in the Union. A remarkable peculiarity of the atmosphere in Western Texas is shown by the fact that, in the center of this

health district in midsummer, fresh meat suspended in the open air will remain there indefinitely without tainting; and incised wounds under any sort of care, rarely ever suppurate. In other words the atmosphere here is inimicable to pyogenic germs, and in this property its antibacillary qualities no doubt reside. It has been asserted by authorities on phthisis that there is nothing specific in any atmosphere for the disease, but in the light of recently discovered facts this statement to the writer seems questionable. The climate of Western Texas will restore to health 85 to 90 per cent. of all phthisical cases consigned to its care in their incipiency; and this, too, with so much certainty that climate in this instance could properly be styled specific.

Nor are its benefits confined to incipient cases alone, since hundreds of human beings to-day are enjoying excellent health in Western Texas, who were carried there upon their beds in search of health many years ago.

*The Best Places in Western Texas for Consumptives.*—So large is the territory under consideration that a description of the various resorts to be found there would be out of the question in an article like this, therefore only brief mention can be made of some of them, except of one.

San Angelo, at the western terminus of the G. C. & S. F. R. R. and Llano on the Austin Branch of the Central Pacific, are excellent and famous health resorts, situated respectively about 1,800 and 1,000 feet above tide water and each quite accessible by rail.

Marfa and Fort Davis are further west, and very much higher, being 5,000 feet above the sea. These are along the line of the Southern Pacific Railroad, but are not so easily reached as the first two mentioned by reason of their distance. Perhaps the best locality for consumptives in all Texas, if not the best adapted place in the world for such cases, is at Comfort. This little German village of 600 inhabitants is situated in Kendall County, on the San Antonio & Aransas Pass Railroad, just 52 miles northwest of San Antonio. It is about 1,700 feet above sea level, and is surrounded by hills and mountains of considerable magnitude. Along the south side of the village runs the Guadaloupe, a most beautiful stream of clear water, while the whole face of creation around is dotted with elegantly kept farms teeming with luxuriant verdure nearly all the year round.

The air here is pure, elevated, crisp and dry, and for the most of the year it is warm, thereby constituting an ideal lung food. This atmosphere is inimicable to putrefaction, and the bacilli of tuberculosis rapidly die out under its strong influence. Here one never feels fatigue, and therefore "that tired feeling" so often complained of by denizens of lower districts is never heard of.

Comfort, being only fifty-two miles from San Antonio, and on a railroad, is quite easily reached from that city. There are some excellent physicians located here, and nearly any luxury desired can be obtained without delay. It is at Comfort, Texas, where Camp Reliance is located, and where invalids, both male and female, reside in tents all the year round for the cure of their disease, relying on the "open air" method.

*How to Reach Comfort, Etc.*—Probably the first question suggested to the reader of this article would be: First, How can one reach Comfort? Second, What would the round trip cost? Third, How long should one remain in that climate before he could safely consider himself cured? Fourth, What accommodations are obtainable out there? And, fifth, What vicissitudes would one have to undergo while remaining out in Texas?

These are all pertinent and practical questions, and experience shows that they are the usual inquiries made by prospective health seekers from Texas physicians. The writer can only answer the first and second inquiry by taking San Antonio as the point of departure for the invalid.

First, as is well known, this last-named city is the great Mecca of the southwest for consumptives. Here they annually flock by the hundreds, and from San Antonio many of them scatter out in all directions in search of better places, as information directs them. There are four great lines of railway running into San Antonio, and all of them transport invalids to this section. These lines are the Southern Pacific, the San Antonio & Aransas Pass, the Missouri, Kansas & Texas, and the Great Northern railroads. Take whichever route is most conveniently reached; though the S. A. & A. P. R. R. has established a route out of Chicago via the M., K. & T. R. R., by which passengers can go through to San Antonio without change of train, a great advantage to the invalid traveler. From San Antonio your trip of fifty-two miles is over the S. & A. P. R. R., familiarly called the S. A. P., a beautiful and picturesque route, and the fare is $1.55 each way.

Second, At Comfort or anywhere around in the neighborhood good accommodations can be obtained in hotel, on ranches or in tents, at from $25 to $30 a month, and your stay in this country should be from four to six months, according to the severity of your case, in order to secure permanent benefits therefrom. Thus, in mild cases, the round trip from San Antonio to Comfort and back should cost you not exceeding $200 for a six months' trip, including everything. As a matter of course, severer cases require longer stay, while those bedridden who go should expect to remain there a year, or even longer. In answer to Question 5 the writer will state that there are no vicissitudes in store for invalids who go to Comfort, over and above occasional inconveniences common to all travelers. The climate there is nearly perfect; the people (nearly all German) are quiet, honest and industrious, and sociable, and it is this very character of the people and quality of the atmosphere that make Comfort the ideal place for invalids to go to.

There is also an abundance of nutritious food to be found in that country, such as milk, eggs,

butter, fresh meats and vegetables,, while game and fish abound plentifully nearby.

Finally, the invalid is within "hailing distance" of civilization, a most important point to be considered in treating these cases, telephone and short railway connections being had with San Antonio, the largest city in the southwest and the most attractive one in the State.

The proximity to so well a supplied base as San Antonio, with its luxuries and attractions, along with all the natural advantages just enumerated, make the little village of Comfort, in the opinion of the writer, far ahead of any place in Texas, if in fact it is not the superior of any to be found in all this country, as a resort for the proper accommodation and treatment of consumptive cases.

Since writing the above, it is learned that a station has been established at Camp Reliance, on the S. & A. P. R. R., just 50 miles from San Antonio, and that tourists are finding this an excellent resort to stop at. The writer would be pleased to give further information to anyone who might desire such upon the climate and resorts of Western Texas.

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## PERINEAL PROSTATECTOMY WITHOUT OPENING URETHRA OR BLADDER—UNSATISFACTORY RESULT—SUBSEQUENT PERINEAL CAUTERIZATION OF EN COLLARETTE NARROWING OF BLADDER ORIFICE—RECOVERY.

BY JOSEPH RILUS EASTMAN, M.D.,
OF INDIANAPOLIS, IND.

The case of prostatic hypertrophy described briefly in the following report concerned an attorney sixty-nine years of age. He was below medium in stature, rotund and phlegmatic. His life in the nature of his calling had been sedentary, and for many years he had drank alcoholic beverages in moderation. He had not been a voluptuary. Constipation had never annoyed him in a notable degree, but an examination of the rectal mucosa disclosed general venous congestion and varicosities. There were no marked evidences of general sclerosis. There was no arcus senilis. The arteries were soft.

The symptoms recited at the writer's first examination and which had begun to appear four years previously, were the classical ones, dependent upon interference with the function of micturition. Undue frequency of micturition had increased until the man was disturbed 12 or 15 times during the night, mostly during the after part of the night. Micturition was hesitating, interrupted and followed by dribbling, the urine falling directly to the ground, not describing the normal parabolic curve.

The amount of residual urine varied between six and eight ounces. There had never been complete retention. Pyuria, slight hematuria, muscular spasm and characteristic pain were present. Bacteria, including *Bacilli coli* and *Staphylococci* were found in the centrifuged urine. Ammoniacal fermentation had begun. The odor of the urine was very pungent. There was present a trace of albumin. The urine also contained hyaline casts and much bladder epithelium. The reaction was alkaline, and the specific gravity hung about 1.024. There was slight intermittent polyuria.

The withdrawal of the urine through the catheter elicited the assurance that the bladder had not lost its expelling power. The posterior urethra was found to be lengthened, the distance from the anterior layer of the triangular ligament to the bladder orifice having measured 3½ inches.

Most small instruments entered the bladder, but not without difficulty, the handles being deflected slightly toward the right. The Coude and Bicoude catheters entered no more easily than the straight instruments or those with the Van Buren or Guyon curves. The cystoscope revealed nothing except that the "bas fond" bulged upward. With stiff instruments, complete entrance into the bladder was not effected without extreme depression of the handles. Upon examination per rectum, the prostate was found to be smooth, harder than normal, and enlarged to four or five times its normal size, the right lobe being slightly larger than the left.

As is often the case, the patient was not aware that he was seriously afflicted, had received no treatment, and at the suggestion of prostatectomy, demurred. Therefore he was put to bed, and continuously catheterized for two weeks, with no improvement.

In view of the inability to demonstrate an intravesical growth with the cystoscope, the general bulging upward of the "bas fond," and the smooth, general enlargement of the two lateral lobes, a perineal prostatectomy was performed. The prostate was exposed by an inverted Y incision, and the capsule was split transversely. The gland was removed, mostly by excochleation, but partly by morcellement. This was accomplished without opening the posterior urethra. The floor of the prostatic urethra was freed with serrated scissors.

The patient being a very poor subject, in a general way, for surgery, as shown by the way he bore the operation, and the urine being highly infectious, the writer had not the temerity at this time to permit the bladder contents to escape through the perineal wound, fearing uremia or sepsis or both. It was hoped that the obstruction was entirely removed, since by sweeping the convexity of the curve of a large sound across the mucosa of the bladder floor, and following it with the index finger in the perineal wound, it could readily be determined that the floor of the prostatic urethra and bladder were quite thin. It was subsequently proven, however, that the obstruction was not removed. The residual urine was decreased in amount, but at least three ounces remained. The other symptoms were in nowise improved. After three weeks the perineal wound,

which had not yet closed, was reentered and the posterior urethra opened.

Upon passing the finger through the posterior urethra, a thin stricture-like obstruction was met at the bladder orifice which raised the bladder outlet at least a half an inch above the level of the bladder floor. This stricture-like obstruction was cut down by galvanocautery division of the urethral floor. This was done with the instrument devised and used by Dr. Wishard, of Indianapolis, for cauterization of the prostatic collar through a perineal incision.

There is nothing in the history of this case after the second operation, which is worthy of note. A large perineal drain was inserted and left in place for ten days. After its removal, the perineal wound rapidly closed and the posterior urethra was dilated with full-sized sounds twice a week for a month. The urine is now (eight months after operation) quite clear and is voided every four or five hours during the day. The patient is gaining flesh and sleeps undisturbed all night.

The writer has designedly omitted to speak of the minor details of treatment pertaining to bladder irrigation, internal medication, and so forth, in this case, for the reason that no unusual agents of any kind were used. He wishes to submit that, had he this case to deal with again, no change would be made in the manner of operating. The man being an unfavorable subject for surgery, and the urine being laden with pus microbes, performance of the operation in two stages, was certainly not without its advantages. The perineal opening with its granulating wall, it may be assumed, safe-guarded in a measure against sepsis and uremia, as Senn claimed in presenting his two-stage suprapubic cystotomy.

In many cases, in the writer's belief, it is more surgical to cauterize the prostatic collar through an aseptic perineal incision under guidance of the eye than to imperfectly accomplish this blindly with the Bottini incisor, searing the bladder mucosa with hot smoke and steam for which there is no exit. The only valid argument in favor of the Bottini operation as opposed to the perineal cauterization is that in the latter there is slight danger of septic or uremic poisoning through the ungranulated defect. This objection is met by executing the operation in two stages.

The writer disclaims the carrying out of a premeditated plan of a two-stage operation in the case cited, but felicitates himself that, through lack of temerity in this particular case, he was perhaps led in the right direction. It is possible that others in the future may see fit, in certain debilitated "prostatikers" with considerable general enlargement and constricting obstruction of the bladder neck, to remove the two lateral lobes, and after permitting the perineal defect to granulate, to cauterize the constricting collar.

Should their success with this method be as gratifying as his own, the author will feel fully repaid for recording his experience.

## MASTOID DISEASE AND MENINGITIS.

BY SEYMOUR OPPENHEIMER, M.D.,
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THE increased attention and critical study of the cerebral complications of aural affections and the brilliant results obtained by the prompt recognition of the nature of the brain lesion or lesions, with the adoption of efficient and radical surgical measures, have led to the obvious conclusion that in many cases of meningitis the primary origin of the affection could be directly traced to some portion of the auditory apparatus. Friedreich has clearly emphasized this view in his statement that the importance of aural disease in the production of secondary diseases of the meninges cannot be overestimated and that the doctrine of otitic cerebral disease now forms one of the most important chapters of otology.

In practically all the cerebral complications of mastoid disease, with the possible exception of isolated, deep brain abscesses, the presence of inflammation of the meninges to a greater or lesser extent, accompanies the more prominent lesion of epidural abscess or sinus thrombosis and the symptoms of the former are masked by those of the latter, or the brain membranes are involved to such a slight extent that recognition is impossible. When the external pachymeningitis, as will be seen later, remains localized and is the result of infection with pus-producing organisms, the condition assumes that of an epidural or extradural abscess, and, as in this particular instance, the condition is primarily one of meningeal irritation, followed by the local pus collection, so may the pathological process possess an obverse aspect and the meningitis may be but the result, especially when extensive, of an infective phlebitis or pus collection extending beyond its boundaries and producing a condition that is rapidly fatal in a short time.

During the course of a mastoid empyema and most frequently in young children, a condition of meningismus or pseudomeningeal symptoms may develop and the difficulties surrounding the selection of proper treatment will be almost insuperable until a sufficient time has elapsed, in order that the value of the various symptoms may be correctly interpreted. Such a case came under my observation several years ago, in which, in consultation, a child of seven years was seen with a history of a purulent discharge from the right ear for one year following scarlet fever. Five days before coming under my observation she had been exposed to a draft and during that night she was awakened by intense, throbbing pain limited to the mastoid region of the same side. The aural discharge rapidly diminished in amount and within twenty-four hours had practically ceased and the mastoid showed beginning swelling of the soft tissues. The child at my first examination was worn out with the constant pain, the mastoid process was exquisitely tender to the

slightest touch and was red and swollen. There was a large perforation in the posterior inferior segment of the membrana tympani and the remains of inspissated pus in the canal and middle ear. The symptoms calling attention to apparent meningeal involvement were intense headache limited to the right side and especially referred to the temporal and occipital regions. The temperature was 103° F. and had been 100½° F. in the morning, while the entire symptom group indicated an intracranial extension of the infection. Immediate operation was advised, but was absolutely refused, so ice dressings were applied to the mastoid. The canal and middle ear were irrigated at frequent intervals with a warm normal salt solution and free drainage was established from the middle ear by removing the retained purulent material and enlarging the opening in the drum. Complete recovery promptly ensued and after a lapse of three years the child has had no further trouble with the ear. While this case recovered, such a result cannot be expected, as a rule, and while it is here cited to demonstrate the prompt subsidence of meningeal irritation in this particular instance, yet operation would have been equally successful and would have removed the dangers in the future to which she may be subjected, from the presence of the suppurating middle ear, which still remains.

The meningeal irritation may not necessarily advance as far as a true inflammation, but the symptoms may be caused by congestion and edema of the brain coverings, but this at first, and especially in the absence of operative treatment, is practically undistinguishable from an infective intracranial inflammation, except by a careful study as shown by the course of the disease. The meninges may be invaded either from the middle ear or by the involvement of the mastoid process, and it is with the latter especially that we have here to deal, although it is almost impossible in cases where the destruction of tissue is extensive to determine the exact path of infection with any degree of certainty.

The proportion of reported deaths from the intracranial complications of aural disease, and especially as regards the relation of the mastoid and meningitis, is suspiciously small, yet, we think, were due credit given to the aural origin of many fatal cases of meningitis associated with abscess and sinus phlebitis, the proportion would be materially augmented. Especially is this so in children, in whom the presence of a meningitis accompanying an acute or chronic auditory infection is not at all uncommon. Gruber found in 40,073 hospital deaths of all kinds, intracranial disease in 1,806, and of these 232 were caused by disease of the ear, while meningitis was present in 115 instances. A fact of considerable interest elicited in this connection being that of the latter number dying of meningitis, the male sex greatly preponderated, 87 being males, while but 28 were of the opposite sex. Korner in 151 observations found diffuse meningitis in 23 as the predominant pathological change, and in many of the other complications patches of adjacent meningitis were constantly present. This is shown by the condition of the meninges in brain abscess, as a large proportion of these pus collections, which can be safely estimated at at least one-third, are the direct result of otitic disease, the infection having been carried by means of the meningeal tissue. As further showing the presence of this factor, McBride in 44 cases of fatal ear disease, found 12 who died of meningitis and in three which were classed as brain abscess on account of the predominating symptoms of that affection, there also existed a condition of diffuse meningitis. The large statistics of Barker, embracing 72,000 cases of all kinds of disease, show 45 fatal cases due to ear disease. In a study which he made of 50 fatal cases 72 per cent. were due to the association of meningitis and pyemia. This author asserts that of the ordinary complications of ear disease, more than nine-tenths probably consist of meningitis, septic phlebitis and pyemia.

While the brain envelope may be involved in limited or extensive areas dependent upon the degree of the infection, the variety of the inflammation may be different in some cases and the ordinary pachymeningitis may be present either as the internal or external variety. Cerebrospinal meningitis may also exist at the same time as a mastoid empyema, but no relation usually can be traced between the two, and as the effects of cerebrospinal meningitis are produced secondarily upon the ear and are not the result of infection from the auditory apparatus, they will not here be considered.

As regards infection, practically but two forms of otitic meningitis may be considered, the first resulting from infection by absorption into the circulation and differing from many cases, inasmuch as the exact path by which the morbid material is carried from the ear to the meninges is unknown; while the other variety depends upon the extension of the inflammation by contiguity from the mastoid region to the dura and from there to the other membranes enveloping the brain. The former variety is rapid in its onset, usually diffused, and once established is necessarily fatal, while the latter form consists of a gradual process, usually localized in its incipiency and when diagnosed early is susceptible of cure by a radical operation. Poli relates a remarkable case of the former variety in which the rapid diffusion of the infection to the meninges and the entire cerebrospinal axis was most astonishing. Purulent leptomeningitis, therefore, is usually fulminating, sets in suddenly and terminates in but a few hours, or may continue before a fatal issue ensues for several days. While the localized focus analogous to an epidural abscess is more or less chronic, with mild symptoms which may apparently intermit from time to time before a regular course is established and which may last for several weeks or even months.

The internal form of pachymeningitis corresponding to the subdural or intradural abscess is comparatively rare, and is usually the result of a

circumscribed area of dural inflammation, becoming softened, corroded and perforating, with the deposition of exudation and infective material in the subdural space. Under these conditions should the pia and arachnoid become agglutinated to the dura, pus may accumulate in this situation and exist as a subdural abscess with softening and disintegration of the adjacent brain tissue. Should the membranes, however, not limit the spread of the infection, a general diffuse leptomeningitis will necessarily ensue.

In addition to the acute inflammatory changes of the meninges, a serous form has also been described, and, like the other, may originate from an otitis and compel surgical intervention. Müller has paid especial attention to this variety, and describes two cases occurring in his practice, in both of which a diagnosis of cerebral abscess was originally made, but no pus collection was found on operation. He considered the correct condition in one to be that of chronic serous external meningitis and an acute internal serous meningitis in the other. The symptoms in the first patient indicating a compressing, cerebral abscess and on account of the sensitiveness of the left mastoid process in connection with a preceding otitis, left little doubt of the otitic origin of the intracranial complications, as evidences of the compression within the skull were slow pulse and a congested retina, while motor weakness, headache, hyperesthesia of the right side, vomiting, vertigo, numbness and slight elevation of temperature, indicated an abscess of the temporal lobe, although there was no aphasia. The absence of stiffness of the nucha and high fever with a regular pulse, were against the presence of meningitis. The operation, however, showed the absence of pus, but the excessive amount of serous fluid found when the brain was exposed indicated a pathologic increase. The dura presented a degree of firmness quite unusual, and it was then considered that the affection was evidently a beginning suppurative meningitis in the stage of hyperemia and serous effusion. The chronic character of the process was shown by the long-continued headache preceding surgical intervention, while the disturbance in gait and equilibrium still persisted, showing that permanent lesions had been induced. In the second case the diagnosis remained in doubt for several weeks after the operation, but gradually the threatening symptoms induced by the compression ameliorated, the serous effusion diminished and the case recovered without further incident.

The location of the original focus of infection in the mastoid or its immediate vicinity will determine to a great extent the initial focus of meningeal infection. It may, however, affect the entire surface when a basilar meningitis is apparently the form of predilection, or the infection may remain localized with resultant discrete abscess, and as the course of the extradural abscess is very slow, adhesions form between the dura mater, pia mater and brain and act as a barrier to the development of a purulent leptomeningitis. While the abscess so formed may remain quiescent for a lengthy period, further infection from this focus may ensue and a purulent leptomeningitis will follow, such a case being reported by Barkan. Secondary inflammation of the meninges, however, varies in intensity and extent in different cases, depending upon the quantity and quality of the infective elements and the power of resistance of the individual tissues. In some a profuse plastic lymph may be thrown out and the inflammation will thereby be limited in extent, while in others no such means of protection are afforded and a diffuse purulent meningitis results, so extensive as to sometimes involve the cord for a considerable extent. Two locations, however, are commonly the seat of choice, the temporosphenoidal lobe and the cerebellum, the particular direction in which the infection takes place depending to a measure upon the anatomical peculiarities of the individual case.

The precise mode of the extension of the infection is subject to great variations, but in a general way it takes place either by direct continuity or indirectly by way of the blood or lymph channels. By direct infection from the mastoid, caries of its inner wall may lead to sinus phlebitis, which in turn may give rise to a septic meningitis. Though the path of infection may be sometimes obscure, it is usually more or less direct, as the area of meningitis is almost invariably on the same side as that of the mastoid empyema. Septic phlebitis of the venous radicles leading from the mastoid is also probably one of the commonest methods by which the septic material is conveyed to the meninges, this route being aided in a considerable degree by the free inosculation of the small vessels of the ear and dura. In this way the infection may be carried through apparently healthy bone.

The dura of the posterior fossa may especially become involved by direct carious processes of the mastoid, or by necrosis, erosion or atrophy, the last form being seen in cholesteatomata. The extension of mastoid disease to the membranes of this region depends to a great extent on the arrangement of the system of pneumatic cells, and as the cells are lined with epithelium they permit the suppurating process to go on rapidly, and if it extends as far as the inner table the infection spreads more rapidly to the meninges than if it were separated from the brain membrane by a compact layer of bone. The relation of the route of the infection to the arrangement and number of the pneumatic cells also varies in the child and the adult, and, as a result of the anatomical structure of the mastoid in early infancy, inasmuch as it possesses but few cells, while the posterior wall is strongly developed, it renders disease of this region in the infant less apt to invade the meninges of the posterior fossa than is the condition in adults. Another factor, which, however, is not of as much importance in regard to the mastoid region as in that of the tympanic cavity, is the presence of occasional clefts or fissures in the bone, the presence of such apertures

of necessity bringing the disease process of the mastoid in direct relation and close approximation to the dura.

When a purulent leptomeningitis develops the pathogenic substance is carried into the arachnoid in various ways, either by perforating the dura or by means of minute channels which leave no mascroscopical evidence. The original area of infection usually develops in the immediate vicinity of the diseased dura and travels from the base of the brain to the convexity of the same side and also across the base to the convexity of the other side, if the process be extensive. The pus is found in the furrows between the convolutions and also in disseminated patches, while the pia mater is hyperemic and edematous. The extreme difficulty of tracing the paths of infection from the ear to the meninges may be sometimes insurmountable. In this connection Wilson has reported a valuable case of leptomeningitis of otitic origin, in which the mastoid contained a deep-seated cavity filled with pus, but no granulations nor softened bone. The symptoms then improved for a day, but rapidly grew worse and the patient died comatose. The autopsy showed a large area of leptomeningitis over the base of the brain and the whole right lobe of the cerebellum, which also contained a small abscess. The dura over the upper surface of the temporal bone was healthy except at the junction of the petrous ridge with the squamous portion, where there was a foramen leading through the ridge from the posterior to the middle fossa and filled with pus.

The nature of the micro-organisms present in the mastoid empyema play some part in the virulency of the meningeal inflammation and a reduction of the virulency of the specific micro-organisms present in a given case effects the occurrence of a circumscribed meningitis, which, of course, is the preliminary condition of nearly all brain abscesses. If, on the other hand, the bacteria be of a virulent character and if they reach the inner surface of the dura, the inflammation rapidly spreads and a diffuse leptomeningitis is the result. For these reasons a brain abscess is rarely found with acute mastoid empyema and with the bacteria attenuated, an infection of the brain substance from the circumscribed meningitis rarely occurs and the patch of meningeal inflammation may exist independently for a long time. Various organisms may be found in the meningeal exudate, but the staphylococcus and streptococcus are by far the most important. Kirchner reporting a case of purulent meningitis with the staphylococcus as the only organism present, while in Hamilton's case of mastoiditis with the pia and arachnoid at the base congested and infiltrated with thick, yellow pus, both cultures of the blood and pus, gave pure colonies of the streptococcus pyogenes.

As illustrating the formation of an extradural abscess from a localized infective meningitis, which originated from a mastoid empyema, the following case well shows the sequence of events and the results obtained by early operation.

C. M., male, aged thirty-five years, has always been in good health until two years ago, when, following a severe attack of influenza, severe pain developed in the left ear and continued for several days, when it gradually diminished in intensity and finally disappeared. This occurred several times within the two years since the primary attack, but as it disappeared spontaneously nothing was done for it. One week before he came under my observation the pain had again commenced and instead of ameliorating was gradually increasing in intensity, so that he was forced by its violence to seek relief. No discharge had been noticed at any time and when the ear was examined the canal was perfectly dry, but exceedingly red and inflamed, especially along the posterior wall, while the tympanic membrane was violently inflamed and was pushed forwards, as if the tympanum contained fluid. The posterior and superior wall in part projected into the lumen of the canal, and all the parts were exquisitely tender. The auricle was pushed forwards and the mastoid was swollen and tender. The temperature was 100° F., while the bowels were constipated. Immediate operation was advised and accepted, and after the usual preparation of the patient the mastoid was opened and found filled with an offensive pus, while there was extensive destruction of bone tissue. But little pus was found in the region of the tip of the mastoid, the greater part of it being in the cells in immediate relation to the antrum. The pus and necrosed bone of the mastoid and antrum was thoroughly removed and free communication established through the tympanum and external canal by the above means. The tympanic cavity was found full of purulent material. Marked relief to the symptoms was obtained and he progressed through the usual course for two weeks, with the mastoid wound healing nicely, when he again complained of pain in the former situation and also located a painful area extending still further back than the mastoid tenderness. Within a few hours he became slightly delirious, food was vomited, his mental condition was sluggish, and he complained of severe pain in the occipital region. The temperature was 104° F. and the pulse 120. No other symptoms that would in any way aid in clearing up the condition could be ascertained. The original mastoid wound was then enlarged backwards and the brain cavity was opened, the dura immediately projecting outwards as a red, granulating, non-pulsating mass. Free incision was made into it, about three drams of pus evacuated and an abscess cavity was found walled in by masses of plastic lymph, although the meninges were beginning to become inflamed in all directions as far as could be seen. The pus was thoroughly washed out, the granulations removed and the usual dressings applied. The pain immediately ceased, and no further trouble was experienced, as the patient made an uneventful recovery. No route by way of which the infection traveled could be ascertained.

A somewhat similar case to this is recorded

by Buck, of a man of fifty-seven years, of strong constitution, who had during a period of ten years five distinct attacks of acute otitis, from all of which he apparently made a good recovery. The present attack had lasted for seven weeks, with headache and dulness of hearing, but no discharge. The posterior wall of the canal was swollen, the membrana tympani was injected and the mastoid was tender on pressure. The drum membrane was incised, but no pus escaped, and he experienced relief for about a week, when the pain returned and the mastoid became swollen. An incision was made through the mastoid periostium and some relief was obtained, further operation being refused by the patient. The following day he became unconscious, pupils were non-responsive, face flushed, head hot, pulse 120 and full, while the breathing became stertorous and death occurred the same night. The autopsy showed a purulent basilar meningitis and a free communication between the mastoid antrum and the cavity of the sigmoid sinus, the two forming an irregular cavity filled with pus.

When a mastoid empyema is about to infect the meninges there is almost invariably marked local pain, usually associated with fever. When such a condition occurs, especially in the presence of a diminishing aural discharge, the patient should be considered in serious danger of cerebral complications.

Headache is probably the earliest and most pronounced of the meningeal symptoms, and while at first it may be more or less localized to the temporal or occipital regions of the affected side, it later becomes generalized, even though the patch of meningitis remains localized, the headache may in some cases be intense and general throughout the whole course of the disease. Dizziness, auditory and visual hyperesthesia, mental weakness, delirium and convulsions are also seen, but are subject to considerable modification by other existing complications, such as abscess with high temperature and slow pulse, or sinus phlebitis of a septic form, accompanied with rapid diurnal changes in temperature. Usually the temperature is high and remains constant with but few fluctuations, but it may vary from 101 to 105° F. Photophobia, vomiting and local or generalized convulsions may also indicate meningeal involvement, while in children general convulsive symptoms are common owing to the high grade of fever usually present from the onset of the meningeal irritation.

The respiratory changes may come on quite early and while in ordinary meningitis breathing is rapid and irregular, with the pulse small and frequent, in the basilar type Cheyne-Stokes respiration is frequently noticed, especially when the posterior cranial fossa has been implicated. The younger the patient the earlier delirium appears, but it is not necessarily characteristic of this form of meningitis as it may not occur until toward the fatal termination of the case and is present in any of the forms of the intracranial complications, although if it should appear early, it may be of value in indicating a complicating meningitis, but only in connection with other symptoms. In other instances it will be absent during the entire course of the disease, the patient slowly passing into a condition of coma and death. The ocular phenomena in basilar meningitis, also present some points of import in this connection, although the optic disks are usually normal as it takes a week for the development of optic neuritis when the disease is limited to the posterior fossa, yet the third, fourth and sixth nerves are sometimes involved; the most important being, in this connection, the involvement of the third nerve, producing at first contraction of the pupil and later dilatation. An early symptom of paralysis also is the failure of the pupil to respond to light, sometimes remaining widely dilated even when exposed to the most intense illumination. Another symptom of the same class of which cognizance should be taken is the development of strabismus from the involvement of the nerves previously mentioned.

Constipation as a rule is often obstinate and especially so towards the end of fatal cases, while if diarrhea be present or the bowels be normal, brain abscesses and meningitis may with a certain degree of assurance, be eliminated. Occasionally, in rare cases, paradoxical symptoms may be present, as slow pulse, aphasia, agraphia, impairment of memory and progressive emaciation, these cases, however, are of a very chronic type and the exact intracranial lesion may only be determined when the case comes to autopsy. In adults, of course, it is possible to differentiate the symptoms of the intracranial complications from that of the mastoiditis, but in children such is not always the case and a meningitis may be fairly well under way before more prominent symptoms become evident.

The pathological changes taking place in the dura vary in their rapidity with the extent of the preliminary infection and from at first being slightly reddened and dull in appearance, the membrane will pass through the successive degrees of vascularity until it becomes thickened and studded with granulation tissue. In the chronic cases dependent upon a circumscribed area of necrosis or caries of the underlying mastoid process, it becomes black in color like the bone, softened and gangrenous, while the parts are bathed in serum and pus and may later perforate producing a diffuse leptomeningitis. Where the destruction of the osseous tissue is accompanied with considerable pus formation, the dura is separated from the bone by a collection of purulent débris, varying in color from the creamy pus of the acute cases to the thin, discolored material in the more chronic forms. As pointed out by Zaufal, in the very chronic cases, the dura may be enormously thickened and present a fibrous or sarcomatous appearance. In one case coming under his observation, the dura being three-fifths of an inch thick.

The late development of basilar meningitis following a previously localized area surrounding a

temporo sphenoidal abscess was well illustrated in the following case:

R. L., female, eighteen years of age, had measles in infancy followed by a suppurating ear for several years. The discharge then ceased for a time, but would make its appearance in small amounts whenever she had an attack of coryza. Four months before she came under my observation the impairment of hearing became markedly worse and a scant foul discharge was constantly annoying by keeping the canal moist. A few weeks later pain began to develop in the aural region, but she stated that she could never definitely localize it with any degree of accuracy, but the slightest movement of the head and body would immediately render it much more intense. On examination, she was in an apathetic state and cerebration appeared to be very sluggish. There was sensory and motor aphasia, marked drooping of the eyelid and the left pupil was dilated, evidences of optic neuritis on this side being well marked. There was a large perforation of the membrane surrounding the umbo and a smaller one in the flaccid membrane. The temperature was 98.2° while the pulse was but 64. Under ether anesthesia the radical mastoid operation was performed and great quantities of blackened necrosed bone and foul pus were removed from the region of the antrum and inner wall. The cortex of the mastoid showed a condition of compactness almost approaching eburnation and was removed to reach the softened areas, with the greatest difficulty. As evidences of cerebral abscess were more prominent even than the mastoid symptoms, an independent trephine opening was made in the skull over the temporo sphenoidal lobe and the dura immediately presented, as in the previous case, as a red, non-pulsating mass. An opening was then made in the inflamed membrane and after considerable difficulty about one-half ounce of pus was evacuated. Considerable improvement was evident in her condition for twenty-four hours, when the temperature ran up to 105°, the pulse became erratic and bounding, varying from 70 to 120, while intense pain was complained of over the entire head, but especially on the left side, where all her trouble had been. The symptoms of purulent meningitis rapidly increased and she died in coma two days after the operation. An autopsy was refused.

The serious aspect of the intracranial complications of mastoiditis renders an early diagnosis of the pathological process present in a given case of supreme importance, and the differentiation of any symptoms indicating a beginning meningitis must, of necessity, be made early in the disease to allow the patient the greatest benefit from operative treatment. The chief symptoms of meningeal irritation are headache, occasional nausea, vomiting, vertigo, moderate increase of temperature and some acceleration of the pulse rate, while thirst, anorexia and constipation are mostly complained of, but are not characteristic. Percussion of the skull affords but little evidence as it may be either painless or painful above and behind the auricle. The differentiation between meningeal irritation and true meningitis in my experience being almost impossible, although the latter may be recognized when the headache becomes persistent and is followed by the group of symptoms above mentioned with, in addition, drowsiness, delirium and stupor, while the pulse at first accelerated, later becomes retarded.

The confusion of the symptom-complex may also be greatly enhanced by the primary stages of the meningitis being due to the congestion and edema of the surrounding parts. An interesting case has been reported by Knapp of aural suppuration with headache, nausea, dizziness and some stupor. Later the mastoid became swollen and tender, and an opening an inch deep was made, but no pus was found. Four days later free suppuration occurred, both from the opening and the canal, and temporary relief was obtained. The grave symptoms, however, returned, with a rise of temperature to 105° and death occurred. The necropsy showed a purulent leptomeningitis of the left temporal lobe and lateral ventricle, while pus was on the inner side of the mastoid, in the attic and especially around the foramen lacerum.

The great difficulty in recognizing the condition is also graphically shown by another case of the same author's of an apparently strong, healthy man, with purulent otitis for three years. The discharge had ceased for one week and there had ensued headache, increase of temperature, drowsiness, stupor, movements of hands, incoherent and difficult speech and delirium. One physician made the diagnosis of a partial meningitis, while three others considered the condition as one of otitic cerebral abscess. The mastoid was sclerosed and under the cortex the osseous tissue was blackened in patches and contained a few small cavities filled with thin pus, while more deeply, the bone appeared healthy, hard and ivory-like, and free from caries or necrosis and gave no clue to the way by which the infection might enter the cranial cavity. The patient died three days later and the autopsy disclosed an extensive tuberculosis of the lungs, pleura and pericardium and a tubercular meningitis which had no connection with the ear.

The difficulty of diagnosis is also enhanced when the otitic meningitis occurs in a tuberculous, nephritic or diabetic individual and a careful survey of the past and present history of the case may even then fail to establish the identity of the affection. As an operation would be more successful if the diagnosis was successfully made before opening the cranial cavity, an exploratory operation may in selected cases be advisable, but usually it is often useless and sometimes it may be dangerous, as it may hasten the unfavorable termination of prexisting lesions, or even induce the formation of new ones.

Aside from the localizing symptoms which are of great value when present, the chief symptoms indicating an intracranial lesion have already been mentioned and the comparative worth of the

different symptoms is of great value in determining the presence or absence of meningitis. Optic neuritis is a symptom of great value, but is less frequent in meningitis than in brain abscess. Headache is very intense in leptomeningitis, although it may be absent in some cases. Slowness of the pulse may be an important symptom of incipient meningitis, but unfortunately it is often not characteristic. Rigidity of the mucha is seen in many conditions and depends upon divers causes, so that it is not characteristic of meningitis, although in connection with other symptoms I consider the rigidity of this region as of considerable diagnostic import. Vertigo and nausea may exist in any of the intracranial complications of mastoid empyema, while fever when high and persistent is strongly indicative of a purulent leptomeningitis, although Allport reports a case of influenza followed by mastoiditis, sinus thrombosis, meningitis and death in which as a most remarkable feature, was the continued presence of a subnormal temperature. The patellar and other reflexes afford little aid, although they are generally absent in meningitis.

The most reliable group of symptoms characteristic of meningitis in adults are in connection with the preceding history, constant high temperature, headache and vomiting. But at the same time any intercurrent acute affection must be excluded and the diagnosis is of necessity rendered much more difficult in children, since any acute affection and even an attack of gastro-enteritis may for a time produce symptoms very similar to those of meningitis.

Finally, lumbar puncture may in case of doubt, afford much valuable information. Grunert in two cases obtained positive results in suppurating leptomeningitis of otitic origin, while Gradenigo used the method in two cases with brilliant results and as under aseptic precautions Quincke's method offers no especial dangers to the patient, it may in certain cases be the only way left to ascertain the presence or absence of pus in the cranial cavity.

It is necessary in this connection, however, to constantly bear in mind in these cases, that it is rare to have but one complication, as two, or even three, viz., abscess, meningitis and sinus phlebitis, may all be present in a fatal case. The exact condition cannot be accurately known until an autopsy is made, but even when such is the case, a careful study will enable one in a limited range, to distinguish the most prominent affection. Such a case has been reported by Knapp, in which necropsy showed mastoid empyema, perforation of the lower mastoid wall and extension of the pus down the neck, with epidural abscesses in the middle of the posterior cranial fossa, septic thrombosis of all the sinuses, of both internal jugular and most of the cerebral veins with in addition an abscess in the temporosphenoidal lobe and cerebellum and diffuse purulent meningitis.

With a better appreciation of the relative value of the symptoms and a constantly improving surgical technic the prognosis of meningitis following mastoid empyema affords considerable hope, especially as favorable results have followed prompt diagnosis and early surgical relief. Macewen having reported six recoveries in itself proves that a lethal issue does not always ensue. In the majority of instances, however, secondary purulent meningitis is rapidly fatal, especially so in patients under ten years of age, so that as a rule it may safely be said that the younger the patient the more likelihood there is of a fatal termination.

In the early stages of meningitis and for but a short time only, ice caps to the head and large doses of bromides to lessen irritability of the nerve centers may be tried in addition to free purgation, but these measures are of little value, and the only hope as regards success lies in the early institution of surgical measures. The earlier the operation is performed the greater the chances of success and as the disease is invariably fatal if not checked by operation, we should not hesitate to interfere even in apparently hopeless cases.

It is unnecessary here to describe in detail the various steps of the operative procedures, but the principles indicated are to perform the radical mastoid operation thoroughly and to take especial care to discover the site of any perforations into the cranial cavity. If such are found they should be enlarged and the brain cavity freely explored, but if, however, no sinus is found, or no area of necrosis suggestive of the site of the meningitis be found, the roof of the tympanum should next be explored by entering the cranial cavity above the meatus. The inner table may also require removal in the area of the mastoid wound and any focus of meningeal inflammation or pus cavity should be thoroughly cleansed, the parts packed and the usual dressings applied.

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# MEDICAL PROGRESS.

## MEDICINE.

**Subcutaneous Nourishment.**—Repeated attempts have not been wanting to nourish the body by means of oil or fat injected under the skin and it is even believed by some that the resting body can be kept at a steady weight by combining these injections with rectal enemata. Experimental data are, however, wanting and it is held by others that the amount of fatty substance absorbed is really so small as to play no part in nourishment. H. Winternitz (Zeitsch. f. klin. Med., Vol. 50, Nos. 1 and 2) has approached this mooted question from an entirely different point of view. He injected iodized fats and could follow their course in the body by quantitative iodine determinations of the urine during life and of the organs after death. The results are very discouraging, for though iodine appeared in the urine very soon after injection, the excretion was so very small and was kept up for such a very long time, that absorption here must necessarily be a very slow process. Thus, several months were required before 500 grams were entirely taken up. Even the rectal administration of oil is more satisfactory, especially if pancreatic substance is added. Another disadvantage lies in the fact that multiple injections are necessary at each sitting. A number of inoperable cases of esophageal and gastric carcinomata steadily lost weight with this method of nourishment and in some, deposits of unabsorbed fat were found under the skin after death.

**Normal State of the Cardia of the Stomach.**—The researches of D. Sinnhuber (Zeitsch. f. klin. Med., Vol. 50, Nos. 1 and 2) prove that the cardia of the stomach is normally in a condition of tonic spasm. This is increased by the muscular fibers surrounding the esophageal opening of the diaphragm and by the oblique entrance of the esophagus into the stomach. The spasm is the result of two forces acting in an opposite direction: the one contracting and the other relaxing. The former is particularly localized in the region of the cardia or the cardia itself, the latter is conducted from the medulla oblongata through the vagi to the cardia. Division of the vagus above the diaphragm leads to relaxation of the cardia, while division high up, especially when the right inferior laryngeal nerve is not injured, will bring about a temporary increase in tone.

**Origin of Urobilin in the Stomach.**—Urobilin is sometimes found in acid gastric contents and A. Braunstein (Zeitsch. f. klin. Med., Vol. 50, Nos. 1 and 2) is of the opinion that it is of intestinal origin just like the urobilin in the bile itself. A high acidity of the stomach contents is not necessary, unless bile rich in urobilinogen has regurgitated into the stomach. This regurgitation must, however, take place through the bile and need not remain in contact with the gastric mucosa long before the test becomes positive.

**Histogenesis of Lymphatic Leucemia.**—The underlying cause of lymphatic leucemia is an increased proliferation of lymphocytes in the lymphnodes. It has always been a question how these cells reach the blood-stream until it was shown, that this takes place, to some extent at least, via the lymphatics. M. Mosse (Zeitsch. f. klin. Med., Vol. 50, Nos. 1 and 2) also examined the vessels and found aggregations of cells around as well as within the vessel-walls. He could not, however, decide whether these cells reached the blood-stream passively or by virtue of their own ameboid motions.

**Hemorrhagic Infarction of the Lung.**—The careful examinations of E. Tiedmann (Zeitsch. f. klin. Med., Vol. 50, Nos. 1 and 2) upon lung infarcts are based upon the study of a large pathological material. They are generally peripheral and wedge-shaped with the base directed toward the pleura so that a prominence is formed. In size they vary considerably; they may be very small and multiple or so large as to involve an entire lobe of the lung. Percussion will give dulness over a circumscribed area of the chest but sometimes there is also a tympanitic note due to the surrounding edematous pulmonary tissue, the air in the bronchi, which is set into motion, or the loss of tension within the immediate neighborhood of the infarct. Mistaking the latter for a tuberculous lesion is hardly probable since the position of the two conditions differs. Further physical signs are, on palpation the vocal fremitus may be increased, or, if the infarct is very voluminous, diminished; on auscultating we often hear neither respiratory murmur nor adventitious sounds except in the earliest stages. If râles do occur, these are pleural or bronchial in origin, or else are transmitted from the surrounding alveoli, and bronchial breathing is not rare since the solid tissue transmits well the bronchial sounds. Bronchial râles are also well propagated where a bronchitis exists. In most cases examined the infarct was situated in the right lower lobe; in only one case was the apex involved. The diagnosis is often rendered very easy by the presence of an endocarditis or nephritis and by the clinical symptoms.

**Observations on Leucemia.**—P. Reckzeh (Zeitsch. f. klin. Med., Vol. 50, Nos. 1 and 2) has had the rare luck to observe seven cases of leucemia, including chronic lymphatic and mixed types, and one complicated by a pernicious anemia. All the patients were males; a history of trauma to the splenic region could be elicited in three, while in the others rheumatism, nervous influences and malaria probably played an important rôle. In the traumatic cases the onset was more or less sudden. The following symptoms deserve mention: Initial hemoptysis and enormous hemorrhages from the nose, fever due to constipation or complications, albuminuria, edema and ascites in the later stages, very marked swelling of the spleen and lymphnodes; dyspnea, due to complicating pleurisy or pneumonia or secondary to pressure of lymphnodes on the bronchi; catarrh of the intestinal tract and marked tenderness of the bones. The characteristic blood-changes were found in all cases. In order to setttle the question of migration of lymphocytes, the author several times applied cantharidal plaster to the lymphatic cases, but only leucocytes were found in the resulting blisters. The pus from a small acne pustule examined was also free from mononuclear cells. Where a pernicious anemia complicated the disease, this was probably secondary from the profuse leucemic hemorrhages. In one case pilocarpine was tried extensively without either good or bad effects. In conclusion, a case of pseudo-leucemia with extensive metastases and one of generalized lymphatic tuberculosis are reported.

**Marked Hemorrhagic Diathesis Complicating Jaundice.**—The case reported by E. Fabian (Deutsch. Arch. f. klin. Med., Vol. 77, Nos. 1 and 2) is exceptional from many points of view. A patient, forty-four years old, was suffering from chronic ob-

structive jaundice with attacks of colic for many years, so that gall-stones were surmised with certainty, but the autopsy revealed caseous tuberculous lymphnodes at the porta hepatis which had completely destroyed the common duct. The direct cause of death was an uncontrollable hemorrhage from almost all the mucous surfaces of the body. The most interesting bleeding was that from the bronchial mucous membrane; for several days before death, the patient became cyanotic and dyspneic in attacks and then voided perfect casts of the bronchial tree, showing clearly the subdivisions of second and third order. These casts consisted solely of clotted blood.

**Circulatory Disturbances in Acute Infectious Diseases.**—It has already been proven that collapse in infectious disease is caused by exhaustion of the vasomotor system. PÄSSLER and ROLLY (Deutsch. Arch. f. klin. Med., Vol. 77, Nos. 1 and 2) have repeated the experiments with improved methods, in order to ascertain what part the heart itself plays in the process. The conclusions were in the main the same, since it was found that the heart is in no way responsible for the lowering of blood-pressure. Quite on the contrary, in pneumococcus and diphtheria infection at least, the heart compensates for the vascular paralysis, by increased work. Whatever weakening of cardiac action eventually occurs is to be ascribed to insufficient circulation in the heart muscle itself from lowered arterial tone. In diphtheria alone, a diminished resistance on part of the heart was noticed, which might develop into complete cardiac paralysis after prolonged action of the toxin. This corresponds with the fact that anatomical lesions are more often found in the heart after diphtheria than after other infections.

**Visceral Syphilis.**—Occasionally intra-abdominal gummata have peculiar locations so that wherever an extraordinary symptom-complex presents itself, syphilis must be carefully considered. The same holds true for common complaints such as gastric ulcer and cholelithiasis, which do not yield to the usual treatment, especiallly if the patient gives a history of a venereal sore. H. QUINCKE (Deutsch Arch. f. klin. Med., Vol. 77, Nos. 1 and 2) mentions several interesting cases from his own extensive practice. In one, marked dilatation of the stomach with all its concomitant symptoms developed and while lavage and diet brought about some amelioration, a real improvement was noticed only after inunctions and iodides. The patient died later of some other cause and at the autopsy the duodenum was found compressed by the remains of a retroperitoneal gumma. In a second case the gummata were located more posteriorly and the liver was the seat of an interstitial process. The correct diagnosis was made during life but only because there also was a motor disturbance in the larynx. Cases III and IV closely simulated cholelithiasis since there was gummatous induration about the biliary passages. Stress is then laid upon the syphilitic mesarteritis which underlies so many aortic aneurisms; in two cases an antiluetic treatment brought about considerable improvement and almost complete disappearance of physical signs, while in a third a compression of the subclavian artery was materially benefited. In conclusion, three interesting cases of brain-syphilis are recorded: the first presented the symptoms of a meningitis with implication of both facial and acoustic nerves or their nuclei; in the second there was also bilateral deafness with right-sided facial paresis, while the last was remarkable on account of its subnormal temperature: the lowest record was 90° F. on the day before death.

**Oxyuris Vermicularis.**—Anybody who will take the trouble to hunt through text-books, will encounter many contradictory views concerning the common thread-worm. This has led A. HELLER (Deutsch. Arch. f. klin. Med., Vol. 77, Nos. 1 and 2) to give a brief account of the peculiarities of this parasite. Its entire life-history takes place in one host. As soon as a ripe egg reaches the stomach, the worm will break through the shell at a certain more prominent place near the head of the egg. The free embryo at once migrates into the duodenum, where it goes through all its phases of development until ready for reproduction. This latter process takes place in the cecum and the vermiform appendix, where the largest number of egg-bearing female-parasites are regularly encountered. The eggs are then deposited in the further downward course, upon the mucus secreted in the colon and rectum and in the moist secretion of the anal fold. Auto-infection is the rule, for since the itching is severe the patients will infect their fingers from where the worm eventually gets back to the stomach. An examination of the finger-nails of persons afflicted invariably shows the presence of eggs and even of young worms. The treatment is simple but must be carried out conscientiously. Calomel is first given, since this removes mucus which is so essential as a breeding place; this is followed up by santonin and large enemata containing 0.2 to 0.5 per cent. soap. After eight days the cure may be repeated. Care should be taken that no affected member of a family goes untreated, since one may reinfect all.

**The Value of Agglutination in the Diagnosis of Typhoid.**—That the value of agglutination phenomena for the diagnosis of infectious diseases is much more complicated than was assumed by earlier authors, is the conclusion arrived at by H. STERN (Berl. klin. Woch., July 27, 1903), from a study of late observations. The increase in the degree of agglutinative action of the blood serum in the presence of the typhoid bacillus, beyond the limits which characterize the non-typhoid sera,—that is in a dilution of 1 to 50 during a two-hour exposure and microscopical observation—cannot at the present time be taken as a certain indication of a present or past typhoid infection. Numerous investigations within the last years have shown that the blood serum of an organism, which has been infected by some specific germ, not only exhibits agglutinative properties in the presence of this particular bacillus, but also reacts in the presence of related varieties. It has even been proved that various proteus and staphylococcus species have also become agglutinated in the presence of the typhoid bacillus. The difficulty remains therefore of distinguishing between a direct and an indirect agglutinative action. Serum diagnosis cannot therefore at present give proof of the true causative factor in an infection—it only indicates the probable source, and the probability is changed to certainty in proportion to the degree of agglutinating power which the serum displays. It seems proper, therefore, not to speak of a positive or a negative Widal reaction, but simply to state that fact, that is to say, the approximate limits observed with the bacterial varieties in question. The reaction is not one which is restricted to one species, but is characteristic of certain constituents of the bacterial cell.

**Nocturnal Incontinence and Adenoids.**—Apropos of two cases in which ablation of adenoid vegetations at once checked nocturnal enuresis of years' standing, U. MELZI (Gazz. Osped., July 12, 1903) reviews the various theories as to the relationship between the presence of adenoids and incontinence; and concludes that whatever may be the pathogenesis of enuresis in adenoid patients, the fact remains that in a large proportion of cases, extirpation of these vegetations does cure nocturnal enuresis; and in the treatment of the latter condition, the possibility of adenoids as an exciting cause should always be borne in mind.

## SURGERY.

**A New Operation for Puerperal Mastitis.**—The disadvantages of the usual, radiating incision, are the long time required for closure of the wounds and the deformity which usually follows. E. Hopmann (Centralbl. f. Chirurgie, Aug. 1, 1903) now makes a semicircular incision around the lower half of the breast, dissects it bluntly from the fascia of the pectoralis major and then incises the abscesses widely from behind forward and from the center to the periphery. The drainage tubes will then lie in the most favorable position so that they can be removed in the majority of cases in fourteen days. The scar will be covered by the pendulous portion of the gland and will hardly be noticeable. Deep abscesses which can not be opened without very deep incisions from in front are also rendered easy of access. A similar operation is recommended for the extirpation of enlarged prepatellar bursæ.

**Spear Wound of the Heart.**—A most interesting example of this condition is described by T. McArdle (Jour. R. A. M. C., Vol. I, No. 2), where a barbed spear was embedded in the chest, passing through the wall of the left ventricle, but without entering the cardiac cavity, and the patient made a good recovery after operation. The patient was a Soudanese, and the spear entered near the lower angle of the left scapula, passed through the chest and projected at a point midway between the left nipple and the midsternal line, about one inch above the nipple. Operation was done. A part of the sixth rib was resected and the spear was found to have penetrated the margin of the left ventricle. This fleshy fragment was divided, the spear withdrawn and the external wound sutured. Restoration of pulse and respiration followed and the man made an uninterrupted recovery. Interesting points are the slight general influence produced by operative interference with the cardiac muscle, the profound disturbance caused by the change in cardiac position, as shown by the apparent fatal syncope which followed traction on the spear while it was still fixed in the wall of the heart, and the peculiar modification of the cardiac sounds produced by the presence of a foreign body in the cardiac wall.

## NEUROLOGY AND PSYCHIATRY.

**Protracted Alcoholic Delirium.**—It is necessary to distinguish this delirium from the acute alcoholic psychoses on the one hand, and from chronic alcoholic paranoia on the other. Protracted alcoholic delirium, according to S. A. Suchanoff and I. N. Vedensky (Roussky Vratch, No. 28, 1903), is observed in persons who have been addicted to alcohol for a very long time, and who have formerly undergone several attacks of delirium tremens. The first symptoms are those of auditory hallucinations and illusions; he hears "voices" which are accompanied by noises in the head and ears; the patient fully appreciates his condition, and is even able to refer to it in somewhat doubtful manner. These auditory hallucinations are of a variable degree of intensity and form. He is cursed for his alcoholic excesses, or he hears some one defending him from maligning enemies; or the hallucinations are of an intensely blasphemous character, etc. In severe cases the patient gradually loses the appreciation of surrounding conditions, and therefore asserts the stronger his belief in the reality of the hallucinations. However, notwithstanding the prolonged character of the affection there is usually no marked inhibition of mental powers, and the "voices" gradually lose their significance. The majority of such patients are thus able to keep out of asylums, and even attend to their ordinary occupations, except, of course, such of them as are prevented by the "voices." A great many of the patients become total abstainers after certain threatening symptoms. Chronic alcoholic paranoia is distinguished from protracted alcoholic delirium by the fact that in the former there is a definite persecution mania, which is often manifested in violent outbreaks. As contrasted with the alcoholic's good-nature the paranoiac is suspicious, quarrelsome and often dangerous. The course of the disease in paranoia is progressive, while under favorable circumstances the alcoholic rapidly improves, and is soon convalescing. Psychically the paranoiac may soon become demented, and, of course, disabled from attending to any kind of work, while the alcoholic's mentality suffers but little. In alcoholic melancholia, which may sometimes be confounded with protracted alcoholic delirium in its early manifestations, there is a condition of depression and despair; the patient is frightened, morose; he suffers from threatening auditory hallucinations of a terrifying nature; he seeks isolation, is unwilling to converse with anybody, etc. Of the cases observed (out of 4,813 insane patients there were 33 with protracted alcoholic delirium) 30 were men and 3 women. Twenty were tainted by alcoholic heredity, 3 by nervous and mental affections of relatives, and in general the hereditary influences could be traced in 96.55 per cent. of the cases. The very great majority—fully 88 per cent.—belonged to the illiterate class of the community, including, among others, agricultural laborers, factory workers, etc.

**Idiopathic Contractions of the Right Arm.**—The patient had been suffering for the last three months with clonic, lightning-like convulsions that would occur 25 to 50 times per minute. They begin by an abnormal movement of the right shoulder joint, whereby the scapula rotates somewhat around its horizontal axis, and the joint is slightly raised, while the head is turned back and the chin to the side. This is followed by a maximum pronation of the forearm and the close approximation of same to the trunk. The hand then drops down to the sexual organs or continues its motions toward the left axillary region, and is then drawn forcibly (by the patient) backward and downward. This cycle of movements which is extremely painful and renders the patient very miserable, ceases only during the sufferer's sleep. Outside of great physical exertion Vershubsky (Prakt. Vratch, No. 27, 1903) failed to discover anything in the patient's past history that would give him a clue to the etiology of the condition. He was compelled to exclude, through the absence of the necessary factors, toxic influence, psychic states frequently characterized by localized convulsions, such as cortical epilepsy, and others; organic disease of the nervous system, as, for instance, tumor of the brain, was excluded by the absence of any other symptoms, etc. Of the functional nervous disorders, the affection did not resemble hysteria, epilepsy, chorea, paralysis agitans, or any of the tics. The only similar disease which could be supposed in this case would be paramyoclonus multiplex; but in this the muscular contractions do not embrace whole groups of muscles, and, moreover, the muscles affected are usually symmetrically disposed, which was not the case in the patient under observation. It thus remained for the author to designate the case as one of idiopathic contractions. As regards the treatment of the condition, it is of interest to observe that neither drugs nor psychic therapy seemed to produce any effect. Not even hypodermic injections of duboisine sulphate, of marked utility in many similar conditions, were of any avail here. It was then decided to place the patient in the hospital with the possible view of operating, when in the course of a few days amelioration showed itself, and in about two weeks patient was discharged

considerably improved. However, as the improvement did not last long, and the patient insisting on anything being done to relieve him, operative interference was finally decided upon. The operation consisted in the separation of the tendons of the various muscles involved in the convulsive seizures. The convulsions ceased entirely during the first three days after the operation, but later on the contractions were renewed though not with the former severity.

**A Definition of Epilepsy.**—Idiopathic epilepsy is the real and original epileptic condition, and should be separated from Jacksonian, traumatic and other so-called forms of epilepsy. This distinction is drawn by J. W. WHERRY (Am. Med., Aug. 15, 1903) and from his own observations and the reports of other observers, he defines epilepsy as a state of autoasphyxia or a condition of physiological strangulation or suffocation; except that the cause manifests itself through obstruction to circulation rather than to respiration, though the ultimate effect in both cases—depriving the brain of oxygen—is the same. Several observers have noted that convulsions have followed hanging, which were similar to those of epilepsy. Convulsions as a physiological process, can usually contend successfully against a physiological cause, as in epilepsy, and it contends with equal vigor, though with less success, against a mechanical one, but in each instance it arises in the same chemic way, from similar conditions, and in both cases it is introduced for purposes of relief. The convulsion therefore arises from a condition of asphyxia, which has its birth in a vasomotor spasm. If the latter could be explained, the author believes that the long-sought cause of epilepsy would be revealed.

## PHYSIOLOGY.

**Contribution to the Study of Spinal Reflexes.**—In the investigation of the spinal reflexes of the European turtle, G. FANO (Archives Italiennes de Biologie, June 10, 1903) was led to recognize marked oscillations in the excitability of the spinal centers, and to suppose that these oscillations are caused by the conflict between inhibitory and automatic actions. He also established the influence exerted by these variations upon the manner in which an animal reacts to external stimuli. It follows from his research that the internal work of the voluntary centers, in acting upon the bulbar functions, so far as it does not express itself in external movements, is revealed as an influence upon the functional capacities of the nervous centers and contractile tissues, which influence, if not having a metabolic basis, might at least be classed among the trophic functions, and which evidently has some effect upon voluntary as well as reflex actions.

**Destructive Ferments in the Animal Cell.**—A contribution to the question as to whether the animal cell secretes a ferment which is capable of destroying sugar is made in the form of a preliminary communication by I. FEINSCHMIDT (Fortschritte der Med., Aug. 1, 1903). He was able to secure from fresh pancreas, liver and muscles, by means of a Buchner press, a fluid which rapidly disintegrated sugar—care being taken that the procedure was carried out with all precautions as to sterility. The addition of small amounts of chloroform sterilize the fluid but do not interfere with its glycolytic powers. The latter are interfered with, however, by the addition of larger quantities of antiseptics. In the presence of hydrogen gas the glycolysis was more marked than in ordinary air. During the process there is produced, carbonic acid, alcohol and various other acids. Fermentation in most cases did not begin until some three to six hours. The author was able to isolate the ferment from the fluid by means of ether and alcohol, and in comparing the two, he found that if the ferment alone was mixed with the sugar, the reaction came on quicker and was more marked than if the fluid itself was employed.

**The Physiological Action of the Proteoses.**—It is well known that the products of proteid digestion, when injected directly into the circulation, exert various toxic effects, among which are the abolition of the coagulability of the blood, and changes in its reaction and composition; an acceleration of lymph-flow; a fall in arterial pressure; anuria; deep narcosis, and other toxic symptoms, as well as a certain degree of immunity toward subsequent injections. F. P. UNDERHILL (Am. Jour. of Physiol., Aug. 1, 1903), under the auspices of the Rockefeller Institute, conducted a series of new investigations in this field, which overthrow the conclusions obtained by Pick and Spiro, who maintained that it is possible to obtain by proteolysis (*e.g.*, by trypsin, autolysis, alkali; with casein and edestin by acid also) typical albumoses and peptones which fail to show any influence upon blood-pressure when they are injected into the blood; and even the typical active products prepared by acid or pepsin-acid methods, lose this activity by a relatively harmless purification (treatment with alcohol) without undergoing a change in chemical character. Underhill's researches lead to the conclusion that there is at present no occasion for attributing the physiological effects following the injection of proteoses into the circulation to the presence of contaminating substances derived from animal tissue or elsewhere. Typical purified vegetable proteids which, when injected, are inert in this regard, yield on hydrolysis with acids, or even water alone, proteoses which provoke the characteristic reactions. The proteoses which are formed by the action of proteolytic enzymes of vegetable origin (bromelin, papain) or purified proteids, likewise alter in vitro the coagulability of the blood and call forth the other well-known symptoms of proteose injections. The proteoses occurring in nature in the vegetable kingdom are similarly active, as was to be expected if the toxic properties are a function of these products per se. No method of "purification" has been found which will deprive proteoses of this characteristic behavior in the circulation; when the chemical make-up of the proteoses is profoundly altered and they lose their chemical identity, the typical physiological action may also be lost. The author regards the failure of other authors to obtain toxic products by hydrolysis of proteids with acids, etc., as attributable, in part at least, to the fact that they injected mixtures of unknown composition and probably containing either insufficient doses of proteoses proper, or antagonistic compounds simultaneously present. Different animals vary in their susceptibility to the toxic action of injected proteoses, the rabbit being extremely resistant. There is at present no reason for denying the existence of many chemically unrelated substances which call forth apparently similar responses in the animal organism.

**The Nature of Rigor Mortis.**—Physiologists have generally attributed the onset of rigor mortis to the coagulation of the myosin contained in muscle. OTTO FOLIN (Am. Jour. of Physiol., Aug. 1, 1903) on the basis of his recent investigations, believes that this supposition is unwarranted. It was Kühne who first announced this hypothesis on the strength of the discovery that during rigor mortis the mother substance of myosin cannot be detected in the muscle. A serious obstacle to this view was the fact that rigor mortis, instead of being a permanent condition, gradually disappears, until Halliburton apparently explained it away by the statement that an enzyme, dissolving the coagulated myosin, thereby terminates the causation of rigor.

Folin brought about an artificial rigor in frogs' muscles by cooling them to —7° to —15° C. The muscles did not lose their translucency, which fact argued against any coagulation of part of the muscle having taken place. Moreover, on chemical examination of the muscle which had passed into rigor, performed by mincing the muscle, extracting the plasma by squeezing it and then heating the expressed plasma, the author found that the coagulum formed equaled in bulk the coagulum obtained in a similar way from muscle which had not passed into rigor. He therefore concludes that rigor mortis must be explained, not upon a chemical, but upon a mechanical basis, and might be regarded as of the same nature as an ordniary contracture. Lending support to this view is the fact that muscles sometimes spontaneously go into a condition of contracture. Of related interest in this connection is the view advanced, in 1901, by A. Spingarn, who, in a series of investigations on the inhibitory phenomena connected with striated muscle, was led to believe that such muscle, in the absence of the proper inhibitory influences, has a constant tendency to pass into a condition of contracture, of which the contractures due to heat, death, cold, spontaneity, toxins (cornutin, veratria, caffeine) and disease (Thomsen's disease) are different forms.

**The Survival Excitability of Striated Muscle.**—That a frog's muscle may preserve its excitability for strong induction shocks thirty hours after death, as stated by Ernst Mangold (Pflüger's Archiv., Vol. 96, Nos. 9 and 10) is not new, but the further discovery that the earlier or later onset of rigor or its disappearance, has no regular influence on the excitability of the muscle, is of extreme interest. The author also discovered the surprising fact that if a muscle, either cut out of the body or left in situ, be allowed to pass into rigor while kept in a physiological salt solution, its excitability, which until the onset of rigor has only slowly diminished, now suddenly undergoes a rapid reduction, as if caused by the mechanical obstacle to its contraction. In the average case the excitability continued after the disappearance of rigor for two to six hours. In harmony with the law that seems to underlie so many necrobiotic and paralytic phenomena, the author found that previous to the fall of excitability there is a remarkable rise. The temperature of 10° to 12° C. preserves the excitability for a particularly long time. The response of muscle to electrical stimuli occurs after the power of response to thermal stimuli has vanished. Contrary to what one would expect, it was found that disease or hunger preceding the death of the animal, rather than diminishing the duration of survival excitability, markedly increases it. The muscles of an embryo-dog, including the diaphragm, reacted fifty-one hours after death, the prolonged contractions resembling those characteristic of veratrin poisoning.

**Insufficient Development of the Pectoralis Major Muscle, Absence of Nipple, Separation of Ribs, and Unusual Course of the Urethra—All in one Person.**—The patient's deformities were discovered through mere accident, when he applied to Zeiliger (Prak. Vratch, Nos. 26 and 27, 1903) with high temperature, general weakness and pains in several joints. The examination revealed entire absence of the right nipple and areola, and a general undeveloped condition of the right side of the chest as compared with the left; palpation demonstrated further that from the third and down all the ribs are free from any muscular layer, and are directly covered by the skin, so that the sternocostal part of the large pectoral muscle and the underlying pectoralis minor are absent. The right shoulder is raised, the right scapula is higher than the left, and there is slight scoliosis of the thoracic portion of the spine toward the right. There is also considerable asymmetry between the right and left sides of the chest. The examination of the penis revealed a very small opening in the lower portion of the organ in the sulcus retroglandularis, from which the urine flows in a small stream. Besides this hypospedia there was entire absence of the urethra in the portion of the glans penis. Physical examination of the lungs and heart elicited pulmonary cirrhosis of the right apex. Patient had also evidently suffered when a child from tuberculosis of the bones. The other portions of the lung show emphysema, which is evidently of a compensatory nature, as brought about by the ready pliability of the right half of the chest which became thinner because of the absence of a considerable portion of the pectoralis major muscle. It was also frequently observed that the lungs were, as it seemed, protruding though the thinned-out walls of the chest, which fact alone would be sufficient to account for the presence of an obstinate alveolar emphysema. Notwithstanding the physical disadvantages under which the patient—a hard-working peasant lad—labored, he was not to any appreciable extent disabled from attending to his ordinary every-day work, and as soon as he recovered from the attack of acute articular rheumatism for which he applied to the hospital, he returned to his work.

**The Hydrolysis of Fats by Means of Steapsin.**—That steapsin is capable of hydrolyzing (saponifying) fats outside the organism, is shown beyond doubt by J. Lewkowitsch and J. J. R. Macleod (Proc. of the Royal Society, July 8, 1903). A few months ago, the former showed that lipase in acting on cotton-seed oil produces hydrolysis to the extent of three per cent. On the other hand steapsin causes hydrolysis to a very great extent. This fact is of considerable physiological importance, inasmuch as the quantitative experiments have hitherto been made almost entirely on monobutyrin and simple esters. It is shown that steapsin is not capable of producing the reversible reaction which it was thought, reasoning by analogy, this enzyme might produce.

**The Adaptation of the Pancreas to Different Foodstuffs.**—A series of experiments were conducted by F. A. Bainbridge (Proc. of the Royal Society, July 8, 1903) in the hope of determining, firstly, whether the pancreas does adapt itself to different foodstuffs, as has been maintained, and secondly, by what means this adaptation takes place. When dogs are fed on milk the pancreas secretes a ferment, lactase, which is capable of inverting milk-sugar, although in dogs not fed on milk no such ferment is present in pancreatic juice. It appears, therefore, that the pancreas does adapt itself to different foodstuffs by modifying the composition of its secretion, at any rate as regards the enzymes. It is believed by Pawlow and others that this adaptation is carried out entirely by a nervous mechanism, and that a given food reflexly excites the pancreas to secrete a juice specially adapted for the digestion of that particular foodstuff. The same view has been adopted by Weinland, as regards the lactase of the pancreas. In the light of Professor Starling's work in "Secretin," it seemed much more probable that the adaptation was due to a chemical stimulus. Since lactase is normally present in the intestinal mucous membrane of adult dogs and is increased in amount by a milk diet, it seemed possible that lactase entered the blood stream from the intestine and was picked out by the pancreas and secreted. But the blood of a milk-fed dog was found to have no inverting action on lactose, nor did intravenous injections of extract of the mucous membrane of the intestines of biscuit-fed dogs cause any secretion of lactase in the pancreatic

juice. Consequently, the lactase of the pancreas is not taken up as such from the blood, but must be formed by the pancreas itself. Furthermore, the experiments show that the intestinal mucous membrane of milk-fed animals, injected into dogs not fed on milk, causes the pancreas to secrete lactase, whereas lactose or extracts of mucous membrane injected separately have no such action. In the present stage of this investigation no complete explanation of these results is offered. It seems probable that as a result of the action of the intestinal mucous membrane on lactose, some chemical substance is formed, which passes by the blood-stream to the pancreas, where it stimulates the latter to manufacture a specific enzyme—lactase.

**The Optical Activity of the Nucleoproteids.**—In a research conducted by A. Gamgee and A. C. Hill, it was discovered that hemoglobin is a dextrorotatory body, while the interesting histon-like albuminous substance globin, which is obtained by the splitting up of hemoglobin under the influence of highly diluted hydrochloric acid, is a normally levogyrous albuminous body. A. GANGREE and W. JONES (Proc. of the Royal Society, Vol. LXXI, No. 473) find, as they had suspected, that the nucleoproteids of the pancreas, thymus and suprarenals, are dextrorotatory albuminous compounds. When a nucleoproteid, by the splitting off of albuminous molecules, which in its original condition formed part of its more complex molecule, becomes converted into a nucleoproteid of the "nuclein" type, its specific rotation increases. It is legitimate to infer that all the nucleoproteids form a class of dextrorotatory albuminous substances.

**The Physiology of Fertilization, Parthenogenesis and Development.**—In the course of a research undertaken to discover the substances in the egg that attract the spermatozoon, A. SCHÜCKING (Pflüger's Archiv, June 16, 1903) obtained many interesting results apart from the original inquiry, namely, as follows: In certain echinoderms the acid-reacting mass of eggs exerts a deadly, on brief exposure a paralytic, and when present in small amount, an agglutinating and attracting action on the spermatozoa of the same or of other species. The acid reaction of the extract of the egg mass with its mucous envelope is caused by the presence of primary potassium and sodium phosphate. On dialyzing this extract it is found that the non-dialyzable portion left behind contains the agglutinating substance. The egg extracts cause the same physiological effects upon the spermatozoa as the eggs themselves. The forerunners of fertilization are partly of a mechanical and partly of a chemical nature. The agglutination of the spermatozoa is brought about by the cooperation of the agglutinating substance in the egg with a special agglutinative substance in the spermatozoon. This phenomenon requires the presence of a certain amount of sodium chloride. It lasts only a short time for the compounds of agglutinin and agglutinated substance dissolves in water and cannot be again isolated. The spermatozoon does not bore its way into the egg, as commonly accepted, but its protoplasm melts into the protoplasm of the egg with the formation of a hyaline excrescence. Surrounded by the latter, the spermatozoon is drawn into the egg. The so-called disappearance of the vitelline membrane is not associated with the formation of a new membrane. Even when the protoplasmic mass appears homogenous, the vitelline membrane is present. It presents a meshy or sieve-like structure being pervaded with the finest of protoplasmic threads. During fertilization there is an interlamellar splitting of the vitelline membrane occasioned by the absorption of water. The increase in size by this absorption is considerable, being not seldom one-third of the volume of the egg. The beginning of the development of the entire ovum is rendered possible by the absorption of water. In the case of the echinoderms studied, in other species and also in man, the spermatozoa show in their penetration of the egg, in individual instances, certain central bodies, which occasion the union of the protoplasm of the spermatozoon with that of the egg. There is no violent penetration of the spermatozoa. Fertilization finds its analogy in the conjugation of the infusoria. The interlamellar splitting of the vitelline membrane is commonly said to protect the egg against polyspermia. But this splitting also occurs in polyspermia if the protoplasm of the egg is damaged by external agencies. The functions of the tail of the spermatozoon are to bring the head to the periphery of the egg, to mechanicallly stimulate the protoplasm threads of the egg by means of the movements of the head, and thereby to bring about union with the protoplasm of the egg. Fertilization may also be brought about by tailless spermatozoa, provided these be brought into intimate contact with the egg. Eggs that are stimulated by means of external agencies offer resistance to osmotic influences. If placed in distilled water, eggs remain for a period of time amounting to several minutes, longer capable of life and fertilization than other eggs. This observation, together with that of the absorption of water in parthenogenetic development, gave the key to the solution of the problem of artificial parthenogenesis. This latter can be brought about by the most widely variant stimuli—chemical, thermic, electric and light stimuli. Following the period of stimulation there is a period of relaxation, during which the water that is absorbed can start the processes of development. Even the direct addition of water in such a manner that the eggs may remain in distilled water for one minute and thereby be allowed to swell up, start parthenogenetic development. The best results were obtained by the use of acetic acid, in the concentration of one to two drops in 200 gms. of sea-water, acting for a period of forty minutes. Also sodium bicarbonate is capable of initiating parthenogenesis.

**Salivary Digestion in the Stomach.**—The evidence that the action of ptyalin is inhibited in the stomach soon after the ingestion of food is inconclusive, according to W. B. CANNON and H. F. DAY (Amer. Jour. of Physiology, Aug. 1, 1903). The support for this evidence from the commonly accepted accounts of mixing currents in the stomach is not well founded. Observations show that in many animals, including man, gastric peristalsis occurs only in the pyloric end of the stomach; the cardiac end remains undisturbed by the waves. Food in the pyloric end is soon mixed with the gastric secretions, but food in the cardiac end of the stomach is not mixed with the acid gastric juices for two hours or more, and in this region, therefore, during that time salivary digestion may go on undisturbed. Examination of the dried contents of the pyloric and cardiac portions of the stomachs of cats, after carbohydrate food mixed with active saliva has been given, shows that the percentage of sugar present is about the same in the two portions at the end of a half hour, and at the end of an hour the cardiac portions contains about 80 per cent. more sugar in unit volumes than the pyloric portion. The actual amount of sugar present in the fundus is relatively much greater than the ratio would indicate, for the fundus contains, after an ordinary meal, about five times as much food as the pyloric portion. After an hour the ratio of the sugar percentages in the two parts of the stomach begins to approximate unity again. This change is probably to be attributed largely to

diffusion of sugar from the fundus into the pyloric end, and to some extent to absorption. The diffusion of sugar does not to a marked degree remove the ptyalin from the food. Position does not very notably affect the differences in sugar production between the two parts of the stomach, although with the fundus lower than the pyloric portion, slightly more sugar is found in the fundus than when the opposite relation is maintained. When liquid food is given, when small amounts of foods are given, and when the stomach is massaged, sugar percentages in the two parts of the stomach are nearly the same. Mixing proteid with carbohydrate foods protects the ptyalin from the action of free hydrochloric acid in the relatively small pyloric part of the stomach and on the surface of the cardiac contents. The greater mass of the food, lying in the fundus, undergoes uninterrupted autolysis, not because the proteid protects the ptyalin, but because the food in this region is not mixed with the gastric juice. Much of the starch not changed to sugar is changed to dextrin, and thus, since dextrin is not readily fermented, the food is saved to the organism. The special value of this process lies in the fact that it occurs to the greatest degree in the fundus, in which region the hydrochloric acid, inhibiting the action of many of the organized ferments, does not for some time make its appearance. In the early stages of gastric digestion, if food has been properly masticated, the fundus serves chiefly for the action of the ptyalin; the pyloric portion, after a brief stage of salivary digestion, is thereafter the seat of strictly peptic changes. Later, after two hours or more, as the contents of the fundus become acid, the food in the stomach as a whole is subjected to the action of proteolytic fermentation.

**The Uniformity of the Pancreatic Mechanism.**—It has recently been pointed out by W. M. BAYLISS and E. H. STARLING that the secretion of pancreatic juice, which ensues on the introduction of acid into the duodenum or jejunum, is due, not to a reflex, but to the production, under the influence of the acid, of a substance (secretin) in the epithelial cells of the mucous membrane. This substance is at once absorbed into the blood vessels and carried by the blood to the pancreas, where it acts as a specific stimulus of the pancreatic cells. The same authors (Jour. of Physiol., Vol. 29, No. 2) find that the pancreatic secretin is not specific for each type of vertebrate animal, but is a simple substance of definite chemical constitution common to all types of vertebrates. On the other hand, in spite of certain assertions to the contrary, there is no doubt that it is specific in its origin and in its action. Apart from the increase of bile, which follows the injection of solutions of pure secretin, and may be direct or indirect, the direct action of secretin is limited to the pancreas. Of course, if a depressed effect is produced at the same time, one will get the usual effects of anemia of the medullary centers, amongst which salivation may be mentioned. Secretin is obtained by extracting the mucous membrane of the upper part of the small intestine with acid. From no other part of the body can secretin be obtained by a similar or any other mode of procedure. The authors tried in this way mucous membrane from all other parts of the alimentary canal, the salivary glands, the liver, spleen, pancreas, kidneys and tongue. They, therefore, conclude that prosecretion exists only in that situation where it is in a position to be acted upon by the acid chyme, and to discharge into the blood the body which shall act as the timely stimulus of the pancreatic cells.

**The Regeneration of Nerve Fibers.**—When certain precautions were taken, J. N. LANGLEY and H. K. ANDERSON (Proc. of the Physiol. Soc., Jour. of Physiol., Vol. XXIX, No. 1) found that in the sciatic and crural nerves, medullated fibers do not regenerate in the peripheral end of a cut nerve in 124 days. But medullated fibers may regenerate in the peripheral end without any connection being formed with the central stump; when such regeneration takes place the fibers degenerate on section of the nerves which run to the tissue surrounding the peripheral stump; *i.e.*, the regeneration which occurs in apparent independence of the central nervous system is not really independent of it. When the peripheral ends of two sensory motor nerves are joined, no contraction occurs in the muscles supplied by one of them when the other nerve is stimulated, but when the muscular branch of the crural nerve is cut, and allowed an opportunity of growing both into its own peripheral end, and into the peripheral end of the internal saphenous nerve, stimulation of the saphenous nerve may cause a reflex contraction in the muscles supplied by the muscular branch of the crural; this is still obtained after section of the crural close to the vertebra, so that it is to be considered as an axon reflex occurring in branching fibers which have grown down from the central end. When the central ends of two nerves are joined together, it is not found that stimulation of one gives a reflex by impulses passing up the other to the central nervous system; *i.e.*, apparently, union does not take place between the fibers, and neither nerve grows into the other. If a nerve is cut in a newly born animal, the nerve grows in length with the growth of the animal, although no union is formed between the peripheral and central ends.

**The Presence of Arsenic in Eggs.**—It has been maintained repeatedly by G. BERTRAND that arsenic, like carbon, sulphur and phosphorus is a constant constituent of the organsim. He now finds (Annales de l'Institut Pasteur, July 25, 1903) that all parts of the hen's egg contain appreciable quantities of arsenic, the yolk containing the greater part. In the 1-200 of a milligram found in one egg, from one-half to two-thirds is found in the yolk. The enveloping membrane contains almost as much arsenic as the white. These observations confirm the supposition as to the existence and the probable rôle of arsenic in all living cells.

## PEDIATRICS.

**Determination of Fat and Solids in Milk.**—To ascertain the relative accuracy of the simpler clinical methods of determining the fat, H. L. K. SHAW (Archiv. of Ped., Aug., 1903) compared five methods, judging the results by the absolute fat as extracted by solvents (ether, gasoline, etc.). In the Babcock test 17.6 c.c of milk are placed in a test bottle and 17.5 c.c. of sulphuric acid (sp. gr. 1.082) slowly added. These are mixed with a rotary motion, then centrifuged for four minutes. Boiling water is then added till the lower part of the column of fat comes within the scale on the neck of the test-bottle. It is again centrifuged for one minute and the layer of fat read off. The Gerber method proved to be inaccurate and clumsy, the Lefferman-Bean test troublesome and also inaccurate. The Holt cream gauge gives only approximate results and requires fresh milk in which the cream has not risen. The Marchand lactobutyrometer is a graduated tube into which 5 c.c of milk are put, a few drops of ten-per-cent. sodium hydrate solution added, then 5 c.c. ether and the whole gently mixed. When the mixture is homogeneous 5 c.c. of 93 per cent. alcohol is added, and carefully mixed. The tube is then immersed in a water-bath at 100° F. for fifteen minutes and the amount of fat read off from the scale. This is an easy method, but sometimes the milk coagulates when the alcohol is added. The extraction for standardizing

was made by Dr. Wheeler, chemist of the New York State Department of agriculture, by spreading the milk over absorbent paper, drying and extracting the fat in a Soxhlet apparatus. Of all these tests the Babcock was nearest the standard, the average error of 30 tests being only 0.07 per cent. and it is the simplest test that can be relied upon.

The total solids in milk may be obtained by evaporation and weighing, or estimated from the specific gravity and percentage of fat. The Babcock formula is to divide the two right-hand figures of the specific gravity at 60° F. by four, and add one-fifth of the per per cent. of fat. This gives the total solids not fat. The Richmond scale is a double slide with specific gravity and lactometer readings for different temperatures. It is even more accurate than the Babcock. The amount of proteids can be approximately estimated by deducting 5.3 for cow's milk or 6.7 for human milk (the average amount of sugar and salts) from the total solids not fat.

**Kidney Decapsulation in a Boy of Nine Years.**—The patient, as reported by T. M. ROTCH and H. W. CUSHING (Archives of Pediatrics, Aug. 1903), was uremic, with general edema, ascites, nausea and vomiting. He voided daily 300 to 800 c.c. of smoky, acid urine of sp. gr. 1.010, and containing one-eighth to one-fourth per cent. of albumin and numerous hyaline, granular, blood and epithelial casts. The urea excreted was 5 to 10 grains in twenty-four hours. After the removal of 4,220 c.c. of turbid serum from the abdomen, the kidneys were decapsulated by the usual method, and were found to be enlarged and without cicatricial depressions on their surfaces. The capsules were not adherent. Five hours after operation the boy passed 30 c.c. of urine, and in the first twenty-four hours 62 c.c. containing 0.39 gms. urea and one-seventh per cent. albumin. Improvement was rapid, headache and nausea disappeared, and the edema subsided. On the seventh day the urea was 11.2 gms. in twenty-four hours, the patient passed 1,170 c.c. of urine and was comfortable. The albumin contained one-seventh per cent. From that time the picture changed. The temperature rose to 105° F., pulse fluctuated from 130 to 140, respiration 35, nausea and vomiting recurred, and death followed on the thirteenth day after operation. The urine had diminished to 230 to 350 c.c. a day with 3.6 to 4.6 gms. urea.

## GENITO-URINARY AND SKIN DISEASES.

**Prostatectomy Incision.**—The proper perineal prostatectomy incision is made the subject of discussion by N. SENN (Jour. Am. Med. Assoc., Aug. 15, 1903). Sufficient exposure and complete drainage are the two essentials demanded of an incision, and according to the author neither of these are quite fulfilled by the incisions of Kocher or Zuckerkandl, with which he has had considerable experience. A new incision which obviates the difficulties and disadvantages of the others is proposed by him, representing in outline an inverted Y. The median incision is made in the usual way, laying bare the membranous portion of the urethra. The lateral incisions are carried from the lower angle of the median to a point half-way between the anal margin and the tuberosity of the ischium, cutting through about the same structures as are involved in the lateral operation for stone in the bladder. The wound is deepened by the use of blunt instrument and all bleeding carefully stopped. The rectum is then detached and the lower segment of the prostate exposed. After incising the membranous urethra on a grooved staff which is inserted into the bladder, the finger may be introduced into the prostatic urethra and the gland pulled forward. The capsule is next incised and the author recommends removing one lobe of the gland at a time. Permanent drainage is then secured for the bladder by means of a soft rubber fenestrated drain, the distal end of which is fastened in the lower angle of one of the lateral incisions. The perineal wound is drained with a strip of iodoform gauze which is brought out alongside the rubber drain. The remainder of the wound is sutured and the bladder is kept practically empty by syphonage and may be irrigated daily. The gauze drain is left in about five days and the rubber drain remains until the urine is sufficiently cleared up.

**Treatment of Constitutional Syphilis.**—After discussing the theories held in regard to the action of mercury in syphilis, and the relative merits of administering it continuously, intermittently, or only when the symptoms demand, A. M. FORBES (Montreal Med. Jour., Aug., 1903) lays down the maxim "Begin treatment with mercury as soon as the diagnosis is reasonably clear, and continue until not only the sore but the last vestige of induration has disappeared and some weeks have elapsed without apparent evidences of infection." With a history of illegitimate coitus followed in due course by a sore with rapid induration and then enlargement of the neighboring lymph-glands it is waste of time to wait for secondary manifestations, especially as sometimes the rash is wanting in persons who afterward present grave visceral and other lesions. The internal administration is the most pleasant and convenient but the least effective. With Jonathan Hutchinson, he prefers the mercury with chalk, rather than the bichloride or protiodide, as it permits fair doses of mercury to be given without inducing poisoning or diarrhea, and it is not irritant. He begins with one grain three times a day for an adult and rapidly increases the dose. Mercury by inunction is a more rapid method of treatment, and white precipitate ointment will be found clearer and less irritating than the usually employed "mercurial ointment." The patient rubs a piece the size of a bean to a walnut into the skin of abdomen, axilla, groin or popliteal space, changing the site of application on successive days. With children the salve is placed on the abdomen, covered with a binder, and allowed to work in by the child's movements. The most prompt action and the surest dosage are gained by the hypodermic method. The author keeps powders of corrosive sublimate, each one grain which he dissolves in thirty minims of boiling water at the time of injection. He begins with five minims twice a week injected deeply into the gluteus maximus, and increases the dose till the full thirty minims are given. The process is painful, but abscesses are rare. For tertiary syphilis mercury is useless, but the iodides in heroic doses, though not curative, have a wonderful power to cause the disappearance of the swellings or effusions. In treating syphilis a mouth-wash should always be employed, and if sores in the mouth do not disappear under mercury discontinue the mercury and try a general tonic for a time. In the case of geographical tongue, abstinence from tobacco may prove satisfactory.

## THERAPEUTICS.

**Cure of Angioma Without Operation.**—A modification of the method used by Fiorani in the treatment of angioma has been successfully applied by A. FRATTINI (Gazz. Osped., July 19, 1903) in 30 cases. This consists in painting the tumor with a preparation of corrosive sublimate dram ¾ (gm. 3) and collodion 2 ounces (gm. 50). The author proceeds as follows: A coating of this solution is painted upon the tumor, care being exercised that it does not spread much beyond the margins. After this has dried—the process

being hastened by blowing upon it—a second application is made, and perhaps a third and fourth according to the tumor's size. When the last coat has dried and the tumor is thus covered with a more or less hard crust, it is covered with absorbent cotton held in place by a bandage. The application is repeated in the same manner after an interval of three days; and, in the case of small angiomata, about three days after the second application the crust thus formed falls off and, as a rule, with it the angioma disappears, leaving but a small cicatrix. From three to four applications at intervals of three days are necessary to the cure of the larger angiomata.

**Antistreptococcus Serum.**—In a very readable article F. Meyer (Zeitsch. f. klin. Med., Vol. 50. Nos. 1 and 2) reviews the value of the various antistreptococcic sera and proves that the serum of Aronson is really far superior to all the previous ones and that it holds out alluring promises for the future in the treatment of septic conditions, provided animal experiments can be looked upon as trustworthy criteria. Only those mice which were immunized against the streptococcus with Aronson serum, recovered from fatal doses; the sera of Marmorek and Tavel were absolutely without influence. The same was true when the serum was injected several hours after the infection, though much larger doses were then necessary. The serum of patients recovered from severe scarlet fever had the same immunizing power upon animals. The most efficacious method of administering the serum seems to be intravenously. Occasionally animals died some time after the serum had been given; the spleen here could not be looked upon as the organ where the germs had remained deposited since the same observation was made where this was extirpated. It seems likely that small thrombi enclose and retain the cocci until the action of the serum has passed off, when they rapidly regain their old virulence and destroy life at a time when all danger seems to have passed. It is thus obvious that the treatment must be prolonged for some time after apparent convalescence. It is difficult to get a clear idea how the serum acts, for it does not seem to influence growth in the culture tube. A bacteriolysis never occurs but merely a marked reduction of virulence, for cocci which have been left for some time under the influence of the serum, will no longer bring about hemolysis. The serum will no doubt demonstrate its value in the septic diseases of man to the same degree when physicians no longer wait till the patient is so low that he no longer reacts to anything else.

**Antitoxin in Hay-Fever.**—The further report on Dunbar's antitoxin is not altogether gratifying. Sir Felix Semon (Brit. Med. Jour., July 18, 1903) reports in very great detail his observations on a series of eight cases which he had personally treated. In England, as here, the weather had been so cold that the usual crop of victims had not appeared in time to furnish material for an earlier report. Before the season opened he inquired of Dunbar and Prausnitz whether one should not in chronically recurring cases inject the antibody as a preventive. He was assured that it had already been tried in Hamburg with the result that in some people predisposed to hay-fever subcutaneous injections had been followed by a swelling of the arm into which the injection had been made, lasting for several days and accompanied by erythema and urticaria. It is obvious from this that the antitoxin as at present made must contain toxic or septic properties. Dunbar shares this view, for he says, "It must by no means be concluded that we may not succeed later on in freeing the antitoxin serum from these properties. It could be shown that while the power of the antitoxin increased, the by-effects not only did not rise proportionately but rather diminished. From this I conclude that they have no direct relation to the specific antitoxic substance and that by removing these bodies the efficacy of the serum will not be interfered with. Inasmuch as these unknown substances were of a very powerful and as yet utterly unknown character, it seemed but fair to the public that it should not be made a possible victim to them, as was the case in the early days of cocaine usage. Repeated trials, however, seem now to have shown that such danger does not exist and that it is safe to place the drug in the hands of the patients for self-use." A ready-made preparation of the serum, called "pollatin," has been prepared which seems admirable. The following directions accompany each vial: A small quantity of the serum shall be carried by everyone expecting a hay-fever attack. Immediately on noticing the very first symptoms of irritation in nose or eye, a drop or two should be instilled upon the affected organ. Inasmuch as, by the very nature of the disorder, fresh doses of infection are continually being brought into action, and as a given amount of antitoxin is naturally exhausted very shortly by these factors, it follows that the treatment, except under the most favorable conditions, must be but palliative. In cases where the instillation has been followed by good results it is necessary to determine what part autosuggestion had played. Occasionally the improvement is so very marked that it must in all fairness be excluded. In fine, the serum is not a panacea. It often gives relief in very early stages but rarely cuts short well-established attacks. Whether the use of a serum which, because of the removal of irritating bodies, may be given in greater and more frequent doses than the present one will increase the efficacy of this therapeutic agent remains to be seen.

**The Use of Chloroform in the Preparation of Vaccine.**—While glycerin exerts an action on vaccine whereby the extraneous bacteria are eliminated in the course of a few weeks, Alan B. Green (Proc. of the Royal Soc., July 8, 1903), finds that by the use of a solution of chloroform in distilled water, the extraneous bacteria of vaccine are eliminated in from one to six hours, the specific germ remaining fully potent for vaccination. The solution of chloroform that can be most advantageously employed in the preparation of vaccine is a saturated solution in distilled water, having a strength of 1 in 200. This is the limit of such solubility. The method of preparing the vaccine in this way is a complex one and need not be detailed here. The following are the considerable advantages alleged to be gained by the use of the chloroform process: (1) So speedy an elimination of the extraneous micro-organisms is attained that vaccine, practically free from such organisms, can be distributed for use within a few hours after its collection from the calf. In times of urgent demand for large quantities of vaccine, such as occur during smallpox epidemics, this process must needs prove of great value, since the necessity for wasting some weeks for elimination of extraneous organisms by glycerine will be done away with. (2) In so far as the vaccination value of vaccine depends on the activity of a living organism, deterioration of that value must occur in the course of a longer or a shorter time. The potency of some vaccines, glycerinated or otherwise, becomes greatly impaired within a few weeks of collection, that is, within the time required for glycerin to exert fully its influence in eliminating extraneous organisms. Some of the vaccines may, at the time of their collection, have possessed a high vaccination value. (3) For a similar reason the chloroform process might be of considerable use in hot climates, where the preservation of the potency of vaccine is frequently a matter of considerable difficulty.

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## THE PROPOSED NEW WATER SUPPLY FOR GREATER NEW YORK.

THE awful lesson of Ithaca has not yet been forgotten: hence we cannot overlook the sanitary aspects of the report of the special commission on water supply which is about to be presented for public consideration through Mayor Low. The full text of this report is not yet obtainable. We are informed that it recommends an intake of Hudson River water at or near Poughkeepsie. Three years ago, in the fragrant time of Ramapo, a survey of possible sources of water supply for the growing metropolis was made under Comptroller Coler's auspices; and about the same time a report was published by the Merchants' Association. The availability of Hudson River water was fully discussed at that time; but the demand of the hour was for facts concerning gallons and dollars, and the minor questions of disease and human life were left in the background. It was all but tacitly assumed that the use of polluted river waters was unobjectionable, provided only the scheme of supply included somewhere a method of filtration.

By means of a Poughkeepsie intake, the city of New York could be supplied daily with a quantity of water variously estimated at from 800,000,000 to 1,500,000,000 gallons. Quantity is a desideratum, and the Hudson River at once commands attention; no other possible source offers a greater volume of water. The upper Housatonic would supply a sufficient quantity of water at a greatly reduced cost; but the Hudson River is in New York State and the Housatonic is not. The latter could be controlled only with the consent and cooperation of the legislature of a neighboring State, and even with such cooperation serious legal obstacles to purchase and control would remain. A readjustment of State boundaries is scarcely to be thought of in this instance, though such a readjustment for similar purposes was effected some years ago by Massachusetts and New Hampshire. The Adirondack region is, indeed, geographically available; economically it is excluded, for the cost of an Adirondack system would be double that of the proposed Hudson River works.

The successful filtration of Hudson River water is scientifically possible. Is it politically probable? The adoption of the Poughkeepsie plan should at all events be preceded by a careful consideration of this question. Public works have a moral as well as a material foundation. Wisdom in the plan of supervision is of incalculable value in such enterprises. The use of Hudson River water without adequate purification would reduce New York from its present sanitary rank to a position which public-spirited men would regard as degrading. Now is the time to remember that a public water supply is a public danger.

The Hudson is a foully polluted stream. The wholesale contamination of this body of water begins in the Mohawk Valley. Amsterdam, Schenectady and Cohoes utilize the Mohawk for their water supply and for the disposal of sewage; the typhoid rate of all three cities is relatively high. The typhoid rate in Schenectady is 100 per 100,000; in Cohoes it is 90, in Amsterdam 52. The New York City rate is only 17, and that of Yonkers only 16. The typhoid rate in Albany is still very high, though much reduced since the introduction of filtration. It is scarcely necessary to recapitulate the fifty-odd towns the sewage of which is discharged into the Hudson. It is sufficiently enlightening to point out that from 1890 to 1899, the typhoid death-rate of the maritime counties of New York State was only one-third as great as that of the Hudson Valley.

On the Merrimac River, Lowell and Lawrence needed the terrible epidemic of 1890-91 to enforce the lesson of the danger of polluted river water.

For each ten thousand lives exposed in that time of peril, New York might endanger its million, and it will indeed imperil them if the proposed Hudson River works should fall into the hands of recklessly selfish, incompetent political partisans. Experience teaches that such a calamity is likely to occur at any time in our political affairs.

Under ideal conditions New York would always own its own watershed and would keep it clear and uninhabited. If this is no longer possible, we must at least insist that the city's storage and filtration plants be administered by men of advanced knowledge and of the highest integrity, fully impressed with the weight and dignity of the task of standing guard over the lives of a multitude. A polluted water supply is a merciless public enemy; let us avoid it if we can—outgeneral it we must.

## "WHERE THE BEE SUCKS."

It has often been said, that there is nothing new under the sun, but if this is true, the sun, in these days of modern discoveries, must have swerved enough from its point of fixation to have rendered visible things that were unseen in our childhood's hour. Thus, we remember in the days of our youth a short and rather illicit poem, that stated didactically, that "God made bees, and that bees made honey." Here, however, all reference to their usefulness ceased, and the subject has been generally considered a closed one, until it has been renewed and amplified by one Dr. Perc, of Marburg.

According to this latest apiarial authority, the chief practical aim and object of the busy little bee, is not, as we have been hitherto taught, to improve each shining hour, by gathering honey all the day from every opening flower, but to utilize, what has been christened in the vernacular, his "business end," in the cure of all sorts of rheumatic ailments, but more particularly those of the articular variety.

How the poison of the sting effects a cure, this "Bee Man" does not state. It may be that there is some special virtue in the venom, or it may serve as a general counter-irritant, but from the fact that he claims that "every organism is made immune from bee poison, and also immune from rheumatism," we imagine that it acts—or that Dr. Perc thinks that it acts—empirically, from some peculiar virtue inherent in itself.

What he loses in theory, however, he certainly makes up in practice, and his directions are sufficiently explicit. He permits his patients to be stung at first by a few bees, and then gradually increases the number until the treatment becomes, like the language from the bunk of the friend and partner of *Truthful James*—"both painful and frequent and free." The stings are "inserted," he says, "near the joint of the muscles affected," but here the description of the technic of his operative measures is obscure, as he does not state how the bee is induced to implant his sting at any indicated spot, in any particular region. The insects, it is true, might be lured there, by smearing the parts with honey, but leading a horse to a well does not always end in his drinking, and as Dr. Perc allows seventy stings "at one sitting," his patient's joints must resemble the Psalmist when they compassed him about like bees.

As to the cases that he reports in support of his discovery, one perhaps will be sufficient to indicate his general method of treatment, and will serve to show that even the victims of the most advanced stages of rheumatic disease, need not despair, provided only that they are willing to submit to the by no means homeopathic "course of cure." The case quoted, is that of a woman, age not given, "who suffered excruciating torture from rheumatism." The usual remedies had been tried by other physicians, without success. The salicylates had proved inert and useless, while blisters and counter-irritants had rendered matters worse, and had only served to increase her suffering and discomfort. At this juncture, she came under Dr. Perc's treatment, and, dispairing of alleviation by any other method, placed herself unreservedly under his direction and control. From the time of the first application of the remedy her condition steadily improved, the pain grew gradually less, as the number of stings was increased. The inflammation abated, each joint became more flexible and mobile, one by one, as "some bee had stung it newly," until she became at first convalescent, and then, according to the report, finally cured. This happy state of affairs, however, was not the work of a single day, nor yet of a single bee, while the strength of will of the patient, with her belief in the ultimate success of the treatment, was as marked as that of her less fortunate biblical sister, who had in vain wasted her substance on physicians. For the number of times that she was stung, while en route to recovery, made a grand total of 6,952 stings, which, as Dr. Perc, with unconscious naïveté, remarks, was a sufficient number to insure a complete success.

As to Dr. Perc himself, he has our respect and our esteem. He is blessed with the courage of his convictions, and it is quite evident, from the *London Mail*, that he has resisted all temptations to belong to other nations, and has remained an Englishman. Thus he does not claim that John the Baptist, who dragged out a nomadic and hoboic existence, and who would have been most naturally and constantly stung by bees, in the struggle for his daily honey, was immune from rheumatism on that account. Neither has he as yet laid felonious and uncopyrighted hands on the pertinent advertisement of his American colleagues that his particular remedy "will cure hives and is nice to eat on bread." For these two mercies we can certainly be thankful and if he can succeed in lessening the arthritic pain and anguish of the British public, he should, at least, be not without honor in his own country.

We do not believe, however, that this Theodore Thickthong method will prove a success in the States. The supply of bees could doubtless be increased by raising them in large quantities, so that the price, per thousand, would be decreased.

But the remedy itself is too strenuous and able-bodied to meet with popular approval, and we fear, bad as the evils of rheumatism undoubtedly are, that when it came to the question of to bee, or not to bee, the average thin-skinned American would rather bear the ills he has than fly to those he knows not of.

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## PRESENT LIMITATIONS OF MEDICAL SCIENCE.

THE beginning of the new century was marked by many eloquent essays upon the brilliant achievements of the hundred years that had just passed and the physician was not the least proud of the scientists to realize how his profession had emerged from a period of superstition into one of enlightenment and progress. Much, very much, no doubt, has been accomplished, but it is timely for us to check our enthusiasm and modestly to acknowledge that much is still terra incognita, awaiting the master mind, not so much for renewed research along the old lines, but for entirely new methods. In pathology and bacteriology especially we seem to have come to a standstill, for, aside from the practical application of the principles of immunity, little of far-reaching importance has been achieved during the last few years. We need but review the long list of important diseases in man and animal, undoubtedly of bacterial origin, but as yet with unknown etiology, to realize with dismay that the enormous amount of laboratory work done all over the civilized world is really without avail and that with the methods at present at our disposal, complicated and time-robbing as they are, we have reached a certain stage and do not seem to advance beyond it. We are to-day almost as ignorant of the germs of scarlet fever, measles, rubella, syphilis, mumps, acute yellow atrophy of the liver, beriberi, noma, Landry's paralysis and a host of other diseases as we were in the days before Koch, and yet hundreds of brilliant minds have spent an untold amount of time and labor in their study.

Truly, Nature does not readily give up her secrets and the time for resting upon our laurels is still far off.

Yet, far from discouraging, these facts will but stimulate to further thought, and already the future holds out many promises. Bacteriologists are becoming conscious of the fact that they must be zoologists as well and that the great group of protozoa may yet be destined to play a more important part in human pathology than at present appears. Much, too, can be expected from more powerful microscopes, for the germs of many diseases are known to pass through the pores of the Berkefeld filters so that a magnification of 2,000 or 3,000 diameters will hardly reveal their presence. And, indeed, a discovery of most promising result is already announced by two Jena professors, H. Siedentopf and R. Zsigmondy (*Annal. d. Physik*, Vol. X, 1903), who seem to have solved the chief difficulty of higher magnification by increasing the illumination of the particles to be examined. Owing to their minuteness, these exert no material influence upon the vibratory period of the light waves and hence appear to the observer as self-illuminating or luminous objects by virtue of their reflected light. Since, however, the reflected light is weaker than the original illuminating beam, it is necessary, in order to secure the advantages of an intensified illumination, to employ the principle of dark-field illumination. This principle is well illustrated by the common phenomenon of the "visible sunbeam" in a darkened room which is penetrated by a ray of light. Dust particles hitherto invisible, can readily be perceived when the eye of the observer is at right angles to the direction of the penetrating ray. If now the illumination is strengthened by employing a more powerful source of light and a condensing lens and the power of the eye is aided by means of a microscopical objective, we have all

the essentials for rendering visible ultramicroscopic particles. By means of their apparatus, the two Jena professors have seemingly accomplished what the great Helmholtz did not conceive as possible. This physicist declared the limit of microscopic perception to be 0.0001 millimeter, while now this limit has been extended to from 0.000004 to 0.000007 millimeter. That such an achievement promises great things in scientific investigation is readily seen.

## ECHOES AND NEWS.

### NEW YORK.

**Dr. Curtis Acting Dean.**—Dr. John G. Curtis, for many years professor of physiology, has been appointed acting dean, to supply the vacancy at the College of Physicians and Surgeons created by the resignation of Dr. James W. McLane.

**Trachoma Hospitals.**—A new hospital for the treatment of trachoma patients from the public schools will be established by the Board of Health some time in October at One Hundred and Eighteenth street and Pleasant avenue. It is the plan soon to establish another trachoma hospital in the Bronx and a third in Brooklyn.

**Tuberculosis Handled by the Board of Health.**—Within a few months victims of consumption will be treated free in a building now being erected by the Health Board on a lot just south of its building in Sixth avenue. The plan is to care for them here until they are in a condition to be sent away to some sanitarium. The success of the open-air treatment at North Brother Island, which was established this summer, had been even greater than was expected. One woman had gained more than twenty pounds, and all the 65 patients were wonderfully improved.

**Governor Odell and State Institutions.**—In a speech recently delivered at Geneseo, N. Y., our worthy Governor, unconsciously confessing the most indefensible part of his administration, said: "Extravagant buildings and useless, high-salaried officials add nothing to the efficiency of treatment in our hospitals or to secure a more efficient administration of our State departments. Such a misuse of public moneys is extravagance deserving of condemnation." His omission to explain the retirement of the local Boards of Managers is noticeable. To the members of these boards the above remarks do not refer, since their offices were filled without salary or even the prospective emolument of political patronage or power. Their notions of the purposes of State charitable institutions were at variance with those of Mr. Odell. He found them with ideas narrowly centered upon the improvement of the unfortunate patients, indisposed to scan the political horizon or give proper respect to his machine.

**Physical Education at Columbia.**—The increasing prominence of school hygiene as a field of instruction is indicated by the announcement that Columbia University has formed a department for the study of physical education in the several gymnasiums connected with the University. The scope of the work can best be shown by the outline of a single course, "Hygiene A." The aim of the course is to give the student instruction in the principles governing the care of the body, to the end that the highest degree of mental and physical efficiency may be obtained. The body will be studied as an organism and as a machine. The study will not be from the standpoint of anatomy or physiology; only a broad outline of the structure and functions of the body will be given, and that only as a basis for the application of hygiene. The course will include a full discussion of the following topics: Muscular activity, its uses, its aims, its methods, and the relative value of the various forms of exercise, general and special; feeding, nutritive value of various foods, relative value of various beverages, the effects of alcohol on the organism, dietaries, and the abuse of stimulants and narcotics; sleep and rest, the expenditure and recuperation of energy, the general regulation of nervous activity; bathing, fresh and salt water bathing, sponge, tub, shower, douche, and plunge baths, thermal baths, the value and danger of the morning cold bath; clothing, heat radiation, conservation of energy in the body, uses of clothing for protection and adornment; sanitary conditions of the home, the site, construction, plumbing, heating, and ventilation; the adaptation of man to the changed conditions of his environment in the cities during the last one hundred years, the change from outdoor to indoor life, the greatly increased demand for nervous energy, with a corresponding decreased demand for muscular energy; the influence of heredity, extent to which mental, moral, and physical characteristics are inherited; the influence of climate on the organism, acclimation, organs most affected by different climates, tropical, cold, temperate, dry, moist climates, fertile and sterile soils, sea air and mountain air, healthful and unhealthful climates; protective measures against infectious diseases, the germ theory of disease, communicable and contagious diseases, immunity, serums, vaccination, boards of health, duties of citizens concerning quarantine regulations, water and gas supply, inspection of milk and foods. A course by Professor Wood will treat of the physical organization of the child; laws of heredity, growth, and development; home conditions necessary to the child's health; school environment; functions of the school physician; prevention of disease and deformity by hygienic surroundings, healthful postures, and activities; adaptation of gymnastic exercises to the different grades; and the regulation of athletics. The medical director, in addition, will hold office hours daily, acting as a consultant and advisor to any student seeking his services. Each student will be entitled to a physical examination, on the basis of which the general hygienic regimen and physical exercise best suited to his peculiar needs will be prescribed.

### PHILADELPHIA.

**Suicide Increasing in Philadelphia.**—Statistics recently published show that for the years 1892 to 1901, inclusive, Philadelphia was twenty-sixth on the list of 50 cities as regards the number of suicides. For the year 1902 Philadelphia is twenty-fourth in the list, the increase being from 11 to 13 per 100,000. The figures for 1002, however, do not agree with those of the coroner who in his annual report, states that inquests were held in the cases of 203 suicides, which would be a ratio of 15 per 100,000.

**Further Action Against the Alba Dentists.**—Attorney-General Carson has directed a writ against the Alba Dental Company of this city requiring that corporation to show cause why it should be allowed to practise dentistry in Pennsylvania. This proceeding follows the recent conviction and sentence of the president and manager for having employed stu-

dents who were not licensed dentists. It is alleged that the corporation is not exercising any of the objects authorized by its charter and that the president, although he owns 98 of each 100 shares of stock, is neither a dentist nor a physician. The company has 11 offices in this city.

**New Hospital in Coatesville Dedicated.**—The new public hospital which has just been completed in Coatesville was dedicated August 29. The building is erected on a high hill in the southwestern part of the borough and is 100 by 80 feet in size. It contains three large wards and ten private rooms. The total cost was over $30,000, a considerable portion of which was donated by Mr. and Mrs. Charles L. Huston, who for the past four years have maintained the Huston Memorial Hospital at an annual expense of $6,000. The rapid growth of the town rendered this hospital inefficient. Both regular and homeopathic physicians will be on the staff of the new hospital.

**Library of the College of Physicians.**—Dr. F. P. Henry, honorary librarian of the College of Physicians, of Philadelphia, has written for the *Ledger* an interesting historical sketch of the library of that institution. The library, which is the second greatest medical library in the world, was begun in December, 1788, when Dr. John Morgan, the founder of the Medical Department of the University of Pennsylvania, presented to the college 24 volumes. The number of volumes is now 67,243, many of them being exceedingly old, first editions, and practically invaluable. Dr. Henry states that in one particular, at least, this library is first of its kind. This point is the extreme liberality of its management. It is not only open to every one, whether physician or layman, for consultation, but the Fellows of the College have the privilege of taking out books for two weeks, and extending the time, if the book has not in the meantime been asked for, to two weeks more. There is but one restriction to non-members, namely, that they must present a card or note of introduction to the librarian from one of the Fellows of the College. This rule has proved satisfactory to all parties concerned. With the new building, which the Carnegie Fund of $50,000 has made possible, the library of the College of Physicians will begin a new era of usefulness.

## CHICAGO.

**Typhoid Fever.**—During the last week the increasing demand for laboratory examination of suspected cases of typhoid fever has been noticeable, although the hospital reports and the typhoid mortality do not show any such increase. On the contrary, the number of cases in hospital remains about stationary, while there were but 17 deaths from the disease reported as against 53 for the corresponding week last year.

**Smallpox.**—Of the twelve cases of smallpox removed to the Isolation Hospital during the week, six contracted the disease from an unreported convalescent found in the rear of a saloon. Ten of the 12 cases had never been vaccinated; 2 had imperfect vaccination marks more than twenty-five years old. The type of the disease this year is much more serious than last year.

**Changes in the Laboratory Force.**—The process of reorganization in the Chicago Health Department began last week with the temporary appointment of Dr. J. F. Biehn as assistant bacteriologist, succeeding Dr. L. A. Kierulff, resigned, and the temporary detail of Dr. George E. Masslich as city chemist, in the absence of City Chemist D. B. Bisbee. While both of these appointments affect only the city laboratory they are regarded as the forerunners of a sweeping change.

**Chicago the Virile.**—Of all the larger cities of the country Chicago has the largest proportion of males in its total population. During the last twenty years Chicago has averaged 5.3 per cent. more males than females, while New York has averaged 2.8 per cent. more females than males, Philadelphia 5.7 per cent. and Boston 7 per cent. more females than males. Not only this, but Chicago's male death-rate is the lowest of the four cities—Chicago, 20.5 per thousand; Philadelphia, 22.9; Boston, 23.5; New York, 27.1, being the averages of the three Federal Census years 1880, 1890, 1900.

**Willard Hospital in Chicago.**—Directors of the Frances E. Willard National Temperance Hospital have decided to erect a $75,000 hospital in Chicago. The building will be the culmination of nineteen years' work on the part of the Directors, all women, and will crown the efforts to treat diseases without the use of alcohol. The building will be five stories high, and one of the wards will be dedicated to the use of the Loyal Temperance Legion, a society of children. The staff of the hospital includes prominent members of three schools of medicine.

## GENERAL.

**More Plague in Peru.**—Three new cases of bubonic plague are reported in Pacasmayo, one in Molendo and two in Lima.

**Fasting as Cure for Dyspepsia.**—Ex-Judge Ellis, one of the best-known lawyers in western Kansas, died last week at his home in Platt. He had followed a theory of fasting to cure dyspepsia and had gone thirty-seven days without food.

**Molasses and Murder.**—Five natives were murdered in August on Diomedos Islands, in Behring Sea, in consequence of a frightful orgy among Eskimo, following the sale to natives of molasses by whalers. The molasses was utilized for the manufacture of a fiery liquor called "hatch." Under the influence of this intoxicant usually calm and peaceful natives become like maniacs.

**Dr. White Appointed.**—William A. White, first assistant physician at the Binghamton State Hospital, has received from the Secretary of the Interior the appointment as superintendent of the Government Hospital for the Insane, at Washington, vice Dr. Alonzo B. Richardson, who died on June 27 last. Dr. White, who is thirty-three years old, is recognized as one of the foremost alienists in the United States. He will leave within a week to take up his new duties.

**Army Sanitarium Inspection.**—Surgeon-General O'Reilly of the United States Army, and W. B. Jansen, of the Atchison, Topeka and Sante Fé Railway, have returned from a tour of inspection of the army sanitarium at Fort Bayard, N. M. Montezuma Hotel, at Las Vegas Hot Springs, owned by the railroad company, had been closed for lack of patronage, and may be turned over to the United States Government for sanitarium purposes. It is understood that the Surgeon-General favors the plan.

**Attacks Census Figures.**—F. L. Hoffman, of Newark, University Lecturer on Actuarial Subjects, at the Fourth International Congress of Actuaries, which met in New York during the current week, paid his respects to official statisticians in the United States, especially to the Census Bureau. "When we are told," he said, "by a Secretary of War that the mortality of the army in Cuba was not greater than that of the City of Washington we do not need large

actuarial knowledge to smile at the statement and dismiss it as without statistical value—a misleading item disseminated to an ignorant public for political purposes." The United States Census Bureau, Mr. Hoffman declared, though not now "in such atrocious shape" as it had been before it became a permanent department, was "very far from being such as to give its statistics value as contributions to science." The bureau needed, said Mr. Hoffman, the services and advice of expert actuaries.

**A Great Problem Settled.**—The problem of epilepsy is admittedly one of great antiquity. We are tolerably sure that it has deeply puzzled physicians in all countries since the days of Hippocrates. The individual, therefore, who has the power of suddenly knocking the lid off the mystery box and showing us at a glance "epilepsy shorn of all mystery" is entitled to our best obeisances, to say nothing of our debt of undying gratitude. It appears that the honor of such a discovery belongs to a young physician who confesses in a recent article on "What Is Epilepsy?" that "there is nothing mysterious or even enigmatical about the disease." He goes on to prove to his own satisfaction that epilepsy is caused by vasomotor spasm that results finally in auto-asphyxia. Auto-intoxication in turn causes the vasomotor spasm. One wonders at the writer's seeming inconsistencies, for after asserting that "there is nothing mysterious or enigmatical" about epilepsy, he concludes as follows: "And if we could but lift the curtain which hangs behind the vasomotor spasm, I believe that the long-sought cause of epilepsy would stand revealed." Is the cause of scientific medicine ever advanced by flashes of inconsistencies as great as these?

**Tuberculosis Aid and Education Association.**—A new association for the alleviation of tuberculosis and the education of the community hopes soon to commence active work in Cambridge, Mass. Its constitution says: "This Association shall be called the Tuberculosis Aid and Education Association," the object being, "To cure at home, if possible, persons suffering with tuberculosis; to relieve with food, as far as possible all needy tuberculous persons; to educate the entire community in the care and prevention of this disease; to promote the establishment of hospitals for hopeless cases." A deep interest is being awakened in the community, and representative men and women are to be found on the Board of Managers. The Advisory Expert is Dr. Edward O. Otis, of Boston, an eminent lung specialist, at one time President of the American Climatological Association. Dr. J. L. Hildreth, a prominent physician, is chairman of the Advisory Board, consisting of twelve physicians who will advise the Board of Managers on medical matters. A trained nurse will care for such cases of the poor as need her attention, free of expense, giving instructions as to the disposition of sputum and the formation of healthful habits. Various committees will have charge of the distribution of food, of lectures, of sanitation, etc. The movement is intended to be largely educational and for this reason there will be on file, open to the public, reports from other organizations working along similar lines, reprints from papers read by physicians before medical and other societies, and pamphlets descriptive of public and private sanatoria. The committee will be grateful to physicians and others, who will donate any of the above. If possible, they would like three copies, one for the library, one for a special room devoted to advisory conferences, and one for private consultation by the Board of Managers. While it is not the intention of the association to become an advertising medium, the committee in charge of outlining the work, feel so deeply the value of sanatoria treatment in the early stages of the disease, that they wish to put themselves in touch with such institutions. They feel that such a collection of information will be invaluable to physicians in advising patients to try a climate peculiarly fitted to each case. With the booklet from sanatoria it would be well to send a brief description of the shortest route of travel between Boston, Mass., and the sanatoria, hotel or boarding house at which tuberculous persons are received, and the price for board or treatment.

**Ithaca and Typhoid.**—Dr. G. A. Soper, special consulting expert of the State Health Department, in connection with the Ithaca typhoid epidemic, has resigned that position. Dr. Soper says that typhoid would be stamped out at Ithaca if the local authorities would follow his instructions, but they have not even appointed a Health Board to succeed the officers who recently resigned.

**The Milk Problem.**—The Agricultural Department at Washington has made a contribution to the general discussion on the quality of milk supplied to cities, a bulletin, a large part of which is devoted to the question of transportation. The bulletin says the agitation of the question of impure milk has resulted in improved practices on the part of persons handling this article of food, but there is still much room for improvement. For instance, attention is called to the fact that the ideal vessel for the conveyance of milk remains to be discovered. There are many cities and towns which have no legal regulations whatever concerning milk. Many suggestions are made for the improvement of the milk supply, among which are the following: (1) The registration of all dairies; (2) official endorsement of properly conducted dairies; (3) inspection of all herds, barns, and dairy buildings once a month; (4) better lighting, ventilation, drainage, and cleanliness of cow stables; (5) whitewashing the interior of stables; (6) eradication of tuberculosis from dairy herds; (7) branding of condemned cows; (8) pasturage for city cows; (9) aeration of milk in pure air; (10) prompt cooling of milk and holding it at a low temperature until final delivery; (11) shipment of milk from farms promptly after milking; (12) delivery of milk and cream in sealed packages. It is noteworthy that these recommendations correspond very closely with those formulated by the Milk Commission of the Medical Society of the County of New York.

**Autumnal Typhoid and the Oyster.**—A recent issue of the *British Medical Journal* contains an official report by Dr. H. T. Bulstrode on the outbreaks of typhoid fever attributed to raw oysters, which followed two of the municipal banquets of last year. On November 10 last, Mayoral banquets were given at Winchester and Southampton, towns a considerable distance apart. Each banquet was followed by an outbreak of illness among the guests, as nearly identical in diagnosis and clinical history as possible. In both cases the percentage of guests attacked was about the same, and included only those who had partaken of raw oysters. None of those who did not eat oysters became sick. A close inquiry established the fact that the only dish of which all the guests attacked partook was the oyster course. The oysters served at both banquets came from the same source, Emsworth, on the same day and, presumably, from the same bed. At Winchester 62 out of 134 guests were attacked, of whom 10

developed typical cases of typhoid fever, the remainder escaping with what might be called abortive attacks. At Southampton 55 out of 132 guests were attacked, and 11 developed typhoid fever. The marked increase in typhoid fever in most cities during September, largely among those who have returned from the country, and are supposed to have brought the infection with them, suggests the inquiry whether indulgence in sea food may not account for this rise in the enteric curve every autumn.

**Obituary.**—Dr. George B. Russell, one of the oldest and best-known physicians of Michigan, died at his home in Detroit August 31, aged eighty-seven years. He was born in Russellville, Chester County, Penn., and did fearless work during the cholera epidemic at Philadelphia in 1836 and in the outbreaks which raged in that city in 1844 and 1845.

Dr. Alexander Montague Atherton, twenty-eight years old, died at Liberty, N. Y., August 28. Dr. Atherton was born in Honolulu, H. I. He prepared for college at Pimaho Academy, Honolulu, and afterward was graduated from Wesleyan University at Middletown, Conn. Later he studied medicine and obtained his degree from Johns Hopkins University in 1901. He won a service in the City Hospital, Blackwell's Island, New York, where, during his interneship, his health began to fail.

Dr. William C. Barrett, dean of the dental department of the University of Buffalo, died in Nauheim, Germany, on Sept. 2. Dr. Barrett went to Nauheim on account of heart trouble, with which he had been afflicted for about a year and which caused his death. Dr. Barrett was one of the best known dentists of this State. He was a member of the American Medical Association, a former president of the Dental Society of the State of New York and a member of the American Microscopical Society.

## CORRESPONDENCE.

### OUR LONDON LETTER.

(From Our Own Special Correspondent.)

LONDON, August 22.

DEATHS OF EMINENT PHYSICIANS—LORD SALISBURY DYING—MEDICAL LEGISLATION.

THE medical profession of this country has within the last week or two lost two of its most distinguished members. Dr. William Smoult Playfair, who died on August 13, was for many years the leading obstetrician in London. He was a brother of Lord Playfair, who was for some time professor of chemistry in the University of Edinburgh and afterward played a considerable part in Parliament. W. S. Playfair, was was sixty-seven years of age, after taking his degree at Edinburgh in 1856, went to India, where he served during the Mutiny. The climate, however, did not suit him, and he returned to Europe. He determined to try his fortune in London, where he settled in 1863. He used to say that he came here, an utterly unknown man, all his worldly goods being represented by a capital of five thousand dollars. He had the good luck to be appointed professor of midwifery in King's College and obstetric physician to the hospital attached to that institution. At that time the influence of that consummate surgical artist, Sir William Ferguson, was paramount at King's and Playfair doubtless owed his appointment largely to his "brither Scot." He made good use of the opportunities of learning his work afforded him by the hospital and became, in the elegant phrase applied by Ferguson to his predecessor, Priestley, a most successful "fumbler of aristocratic vaginas." Among his patients were several members of the Royal Family, including Her Imperial Highness the Russian Duchess of Edinburgh. Some years ago, however, Playfair, for some reason, lost the greater part of his royal connection, his place at the bedside of parturient princesses being taken by Sir John Williams. It was said that Playfair's fees were considered too high, and this may possibly have been the case, for royal personages are apt to look upon the mere honor of ministering to their august persons as in itself a sufficient reward. Whatever may have been the cause, Playfair certainly lost the favor of the Court. Hence he remained plain "Dr." Playfair, having the mortification of seeing titles and distinctions showered on the man who was preferred to him. There can be no doubt that Playfair was hardly dealt with. Apart from his services to royalty, his professional eminence fully entitled him to one of the titular decorations by which merit is recognized in this country. Whatever chance he might have had of such distinction was, however, destroyed by the famous trial in which he had the misfortune to be the most prominent figure a few years ago. As the case is a *cause célèbre* in the annals of British jurisprudence, and as the result makes it of momentous importance to all members of the medical profession, it may not be uninteresting to recall its principal features.

An Australian lady who had married a brother of Playfair's wife consulted him about certain symptoms. He examined her under an anesthetic and came to the conclusion, as she was not living with her husband at the time, that she had misconducted herself. He communicated his suspicion to his wife, who in turn told it to a relative who was making the lady concerned a considerable allowance. This was discontinued, and the lady and her husband brought an action against Playfair for slander. Her cause was pleaded by Mr. Lawson Walton with such ability that the jury awarded the unparalleled damages of $60,000. By a settlement arrived at later between the parties the amount was diminished to $46,000, but the damages remained a "record" in our courts, till the other day, when in a divorce case the same advocate got for the wounded honor of an outraged husband the substantial compensation of $1,250,000. Dealing with the question of professional secrecy, the judge, Sir Henry Hawkins, now Lord Brampton, said that the medical profession had no power to legislate on the matter. They might make their own rules—and he daresay they did so to the best of their ability—for their guidance as professional men, but they could not impose upon the public their self-made laws, as being binding upon them. The medical gentlemen called on behalf of Dr. Playfair said that they were only rules by which they regulated their own conduct. They mentioned two exceptions. In the case of a witness being called into the witness box in a court of justice, and asked to divulge a professional secret, they held that under those circumstances they were bound to give utterance to it. The judge declined to discuss the point, because he had a little doubt whether the rule could be stated so generally as that. Having regard to a variety of circumstances, there might be some matters which the judge might think unreasonable to be divulged by a professional man, and therefore he might refuse to permit it, and allow the witness to refuse to answer. He did not think, therefore, that because of the rule made by medical gentlemen they were bound in all cases where they were asked a question by counsel in court as to professional secrets, to answer. In his mind, they were not, in all cases, bound to answer. Each case must be considered by its own particular circumstances and by the ruling of the judge who happened to preside on the

occasion. It must be taken for granted that the judge would decide according to law. There was always a rule to set a judge right if he went wrong; on the occasion, however, on which he was ruling, his ruling would have to be taken as law. It was also said by the medical witnesses that if in the course of professional practice they came across a case which indicated either that a crime had been committed or was about to be committed, they were bound to divulge it. To whom? To the Public Prosecutor! If a poor, wretched woman committed an offence for the purpose of getting rid of that with which she was pregnant, and of saving her character, her reputation, and, it might be, her very means of livelihood, and if a doctor was called in to assist her—not in procuring abortion, for that in itself was a crime—but called in for the purpose of attending her and giving her medical advice—how she might be cured so as to go forth about her business, the learned judge doubts very much whether he would be justified in saying to the Public Prosecutor: "I have been attending a poor, young woman who has been trying to procure abortion with the assistance of her sister. She is now pretty well, and is getting better, and in the course of a few days she will be out again, but I think I ought to put you on to the woman." To his mind a thing like that would be a monstrous cruelty. Therefore, when it was said that there was a general rule existing in the medical profession, that whensoever they saw, in the course of their medical attendance, that a crime had been committed, or was about to be committed, they were in all cases to go off to the Public Prosecutor. The judge felt bound to say that it was not a rule which met with his approbation, and he hoped it would not meet with the approbation of anybody else. There might be cases when it was the obvious duty of a medical man to speak out, as, for instance, in a case of murder. A man might come with a wound which it might be supposed had been inflicted upon him in the course of a deadly scuffle. It would be a monstrous thing if the medical man might screen him and try to hide the wound, which might be the means of connecting the man with a serious crime. That was a different thing altogether. All the medical witnesses had admitted that professional secrecy was inviolable with certain exceptions. He (the learned judge) had mentioned the one of the witness in the court of justice, and also the other where a crime was brought to the attention of the medical man, and now came to a third. Communications between a doctor and his wife or children were said to be privileged where it was necessary to reveal them in order that the wife or children might be protected. He thought that that required a great deal of limitation, because cases might be imagined where the wife might be living under circumstances in which she did not want any such protection at all, and giving to her a secret belonging to a patient would be only a wanton violation of the rule. It was, however, a very delicate question, and would have to be argued some day. It will be seen that the learned judge left the question of professional secrecy precisely where it was before—that is to say, in a state of confusion which places the medical witness absolutely at the mercy of the judge. Dr. Playfair had the sympathy of the profession, and this was manifest in a striking manner at a banquet given in his honor on the occasion of his retirement from his chair at King's College. At that banquet, which was presided over by Lord Lister, many leading members of the profession were present.

Lord Lister referred to the trial, which he spoke of as a travesty of justice that did not in the slightest degree diminish the esteem in which Dr. Playfair had previously been held. All those present, whether former students, former colleagues, or others, rejoiced in this opportunity of doing honor to Dr. Playfair, and united in a cordial wish that his retirement from the hospital and professional duty might be followed by many years of health, prosperity and happiness. Dr. Playfair, in answering the toast, said he could not refrain from making some remarks about the trial, and he might mention that Mr. Gladstone, to whom he was practically unknown, had done him the signal honor of writing to him a letter not marked private, so that he was justified in quoting it. In this letter Mr. Gladstone said: "Having most carefully studied all the evidence in this trial, I can come to no other conclusion than that you have done neither more nor less than your duty."

Dr. Playfair had prostatectomy performed on him last year by P. J. Freyer, after four years of catheter life, borne with great fortitude. In the spring he had a stroke of apoplexy at Florence and in the summer he came home to St. Andrew's to die.

Dr. George William Balfour, who passed away in his eighty-first year on August 9, was for many years one of the leading clinical teachers at Edinburgh. His advice was much sought after, especially in cases of heart disease, on which he was a leading authority. His books on diseases of the heart, and especially on the senile heart, rank among our classics of medicine. He began professional life as a veterinarian, but soon betook himself to medicine. He was a man of the type of character which the Scots themselves call "dour," and was more respected than loved by his professional brethren. He had none of the graces of manner which make the fashionable doctor, but he was certainly a great physician. He was an uncle of Robert Louis Stevenson.

As I write, Lord Salisbury, who was for so many years the ruler of this country, is dying of cardiac dropsy. He has suffered for a long time from Bright's disease, and his health, never strong, was undermined by hard work. He is attended by Sir Richard Douglas Powell and a young doctor named Walker, who half a dozen years ago was an obscure country practitioner, apparently with no prospect of ever being anything else. He had the good fortune to be called in an emergency to the late Lady Salisbury in her last illness. She took a great fancy to him, and her husband took him up and launched him among the aristocracy. Now he is the trusted adviser of half the peerage, a fact which of itself is sufficient to gain for him the confidence of the British public.

Parliament has been prorogued. The session just ended has been practically barren of medical legislation. A bill to amend the Medical Acts was among the "innocents" included in the slaughter which occurs every year at this time. Practically all that has been done has been to continue for another year the existing vaccination act, to which we owe the "conscientious objector." The government was just as glad to temporize on the matter of so contentious a measure. But the question will have to be faced next year, and the opponents of vaccination are preparing for the struggle.

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**Lesions of Gout.**—The necrotic areas seen in tissues where urates are deposited are not considered by K. A. Krause (Zeitsch. f. klin. Med., Vol. 50, Nos. 1 and 2) to be really necrotic in the pathological sense of the word, since all the structure of the cells is lost completely. He believes they are merely embedding substance together with the frame-work of the crystals which are invariably found here. The crystals are not, however, limited to such location; they also extend between cells which in every way appear normal. Though the relation between the crystals and the so-called necroses is not cleared by this article it seems probable that death of tissue does not precede the deposition.

## TRANSACTIONS OF FOREIGN SOCIETIES.

### German.

ANATOMY AND THERAPY OF EXTRA-UTERINE PREGNANCY—TUBAL AND INTRAMURAL PREGNANCIES—VAGINAL OPERATION AND ECTOPIC GESTATION WITHOUT SHOCK—THE MECHANISM OF BIRTH—THE BIOCHEMICAL EXAMINATION OF THE BLOOD—ANALYSIS OF THE BLOOD AND URINE—PHYSIOLOGY OF METABOLISM BETWEEN FETUS AND MOTHER—ECTOPIC PREGNANCY—PERMANENT RESULTS OF OPERATIONS—RULES FOR OPERATING—CAUSE AND PREVENTION OF PUERPERAL FEVER—UTERINE CANCER—PSEUDOPAPILLARY OVARIAL CYSTS—SCOPOLAMIN HYDROBROMATE WITH MORPHINE TO PRODUCE ANESTHESIA.

THE chief topic of discussion of the German Society for Gynecology, which met at Würzburg June 2 to 6 was the Anatomy and Therapy of Extra-uterine Pregnancy. The congress was opened by a paper by J. VEITH and WERTH upon the still obscure, early changes which take place in the tube when a fertilized ovum becomes definitely lodged there. The reflexa is then formed in part by the folds of the tube, but besides this there is another true reflexa of varying development. The hole in the epithelial layer through which the ovum slips, will again close and the tissue which bridges over the gap constitutes this reflexa. As the ovum increases in size, its peripheral portions will exert a destructive action upon the maternal tissue so that a strip of coagulation necrosis is regularly found where fetal and maternal cells meet. This is not due alone to the hemorrhages which are so common here. Views were also exchanged upon the position the developing fetus acquires with reference to the walls of the tubes and it was generally conceded that it was imbedded within the muscular layer. Tubal abortion is merely a result of development under unsuitable conditions since hemorrhages will readily occur by destruction of the weak layer between the ovum and the lumen of the tube and by the arrosion of vessels. In the majority of cases this will bring about an early death and extrusion of the egg. It is entirely wrong to look upon every ectopic pregnancy as if it were a malignant neoplasm; this view should only influence therapy in case the fetus is alive and steadily developing.

H. W. FREUND refers to five cases operated by him which closely simulated tubal pregnancy. Twice the condition proved to be pure hematocele, twice tuberculosis and once a neoplasm. Hematocele pure and simple is not so rare as some would believe, and is due to mechanical hyperemia or general venous stasis. One is not justified in pronouncing a case tubal pregnancy, if chorionic villi cannot be found in serial sections. The assumption that the egg may have fallen from the tube is untenable in view of the fact that it is firmly imbedded. Analogous conditions are the hemorrhages into the uterus and its mucous membrane in apoplexia uteri, the ovarian hematomata in local and general congestion and the hematosalpinx in congenital and acquired tubal occlusion.

The lodging of an ovum in an accessory tubal diverticulum is considered by FÜTH of great importance. Fetal and maternal epithelial cells will come in contact and the former will acquire the upper hand. The tubal tissues will not grow in proportion to those of the ovum so that part of the surface of the latter will soon project into the tubal lumen. Everywhere one misses the power of adaption on part of the mucous membrane.

Five interesting cases are reported by HEINSIUS, viz., one of intramural pregnancy, the ovum being situated in the muscularis of the uterus; one of ectopic gestation with ovum between a main and an accessory tube at the fimbriated end and three cases of tubal abortion. Of these, one was complete so that the blood pressed out the egg at the fimbriated end, in the second the egg remained as foreign body within the tube, since the marked convolutions prevented an extrusion and in the third there was secondary rupture with tearing off of a tubal fold. Interference with the growth of the ovum is due to the destructive growth of the Langhans cells; they continue to proliferate for some time even after the death of the ovum. Reaction in the maternal tissue manifests itself in the form of edema and hyperemia in the immediate neighborhood of the egg. The variations in the pathological process depend upon (1) the individuality of fetus and mother. Generally the fetal cells show a greater power of reproduction. (2) The length of duration of the pregnancy. As the fetus develops, the fetal cells will divide less actively, the maternal more so. (3) The time that has elapsed since pregnancy has been interrupted. Concerning therapy, the following may be said: The living ovum is a constant menace to the mother, while, if dead, there is always the possibility of renewed hemorrhage from the site of insertion. Hence early, conservative operation is the most safe procedure.

The Therapy of Extra-uterine Pregnancy was the title of a paper read by SARWEY. He states that an operative procedure is always indicated: (1) In the second half of pregnancy, whether the ovum is alive or dead; (2) also in the early months if the ovum lives; (3) with recent rupture and signs of profuse, internal hemorrhage. An expectative and symptomatic treatment is in place with dead ovum and tubal abortion with or without hematocele except with (*a*) decomposition of the hematocele; (*b*) symptoms of pressure and severe attacks of pain; (*c*) accompanying severe disease of the generative organs, which requires operation. When the conservative treatment is carried out, preparation for immediate operation must be made. This must be resorted to (1) with steadily increasing hematocele; (2) where absorption does not follow and the patient becomes weary of her long illness. The abdominal method is to be preferred since better access is gained and the hemorrhage is more readily controlled. Colpotomy is to be restricted to cases of uncomplicated tubal mole without hematocele and to hematoceles which have suppurated.

STRASSMANN reports favorably upon vaginal operation in ectopic gestation if rapidly performed, without shock and without subsequent dangers of a hernia. He does it especially with unruptured sac, with free hemorrhage and with less recent tumors with exacerbations. Drainage is not necessary except where a large cavity is encountered.

The paper of FEHLING contains some valuable remarks upon the mechanism of birth. Where the forceps are applied with the head low down in the pelvis a number of accessory rotations occur which can be used to assist birth by applying 2 or 3 fingers of one hand to the small fontanelle or sagittal suture. Rotation of the anterior shoulder may be resorted to to assist rotation of the head. Excessive rotation may be brought about by a wrong position of the patient, especially in multiparæ.

The biochemical examination of the blood of pregnant women is discussed by OPITZ. He was not able to detect substances specific for placental tissue by means of the precipitin reaction, in the blood of pregnant women. An antitoxic serum against human syncytial toxins was manufactured and injected into eclamptics with due care, but conclusions cannot yet be drawn from the results.

LIEPMANN speaks upon the biological detection of placental substance in the blood and states that he has succeeded in isolating a serum specific for the placenta,

Retroplacentar and fetal blood gives the characteristic reaction and porticulary rapid precipitation occurs with the serum of patients suffering from nephritis gravidarum.

A careful analysis of the blood and urine in eclampsia, forms Zangemeister's contribution. Red and white cells are increased, the molecular concentration and the nitrogen in the serum are increased and the alkalescence of the blood diminished. Proteids and chlorides occur in normal proportions. There seem to be marked variations in comparison to normal blood. Since these changes are occasionally absent they cannot be looked upon as the cause of eclampsia, but must be interpreted as secondary to retention of urine or circulatory disturbance. The amount of water in the urine suffers a reduction which is most marked during the attacks but again is not the direct cause of the convulsions, since these often cease before the disappearance of oliguria. The same may be said about the retention of salt. The cerebral symptoms point to a spasm of the cerebral vessels. Uremia is not the direct cause of eclampsia, but the latter is frequently complicated by a secondary uremia.

Mandl then follows with a paper upon the Physiology of Metabolism Between Fetus and Mother. Various drugs injected into the mother, readily passed over into the fetus, no matter whether the fetus was still in the uterus, or only in its membranes or simply connected with the mother by means of the umbilicus. Thus atropine caused mydriasis and pilocarpine profuse perspiration. Adrenalin alone did not pass into the fetal circulation.

The second day of the congress was devoted to the demonstration of a number of interesting specimens of Ectopic Pregnancy and to the discussion of operations for prolapse.

A. Martin does not consider position of the uterus and trauma at birth of such great importance in the causation of prolapse. In virgins, tuberculosis and masturbation are of prime importance; in married women the loss of resistance on part of the connective tissue. Trauma, inflammation and tumors are only the exciting causes. Hence constitutional treatment and care during the puerperium, climacterium and after infectious diseases are of the greatest importance. Pessaries do not constitute prophylactic measures, and it is more rational to resort to early operation. Later the interference is rendered more difficult and extensive. The best plastic method and the best means of fixation are not yet decided upon. Extirpation of uterus and vagina is only rarely indicated though the results are good. To pass judgment upon the value of the various operations, surgeons must carefully individualize and all patients should be reexamined after a certain time.

Küstner lays stress upon the correction of malposition of the uterus to avoid bad results. A recurrence generally occurs in the first year after operation. He does not criticise pessaries so severely as Martin and believes they are certainly in place where patients can take care of themselves.

Halban and Tändler have found that a marked difference exists between the anatomy of vaginal prolapse with elongation and true uterine prolapse; in the former the relations are almost normal, while in the latter there is a maximum descension of the entire pelvic floor. Hypertrophic elongation does not always consist of a lengthening of the cervix, but in the majority of cases of an elongation of the lower uterine segment.

Ziegenspeck ascribes prolapse to a difference between abdominal and atmospheric pressure. Deficient involution during the puerperium and tearing off of the vagina from the levator most frequently disturb the normal relation. Hypertrophy of the prolapsed portion is generally only apparent, and caused by edema. The uterus could not be artificially prolapsed in cadavers, probably on account of long previous illness which permits the organ to slip back. In recent cases massage is excellent and a narrowing of the soft parts of the pelvic outlet will cure every case.

Schaeffer believes that the frequent combination of prolapse with vasomotor and nervous disturbances points to a primary as well as secondary origin of the latter. The very interesting blood-examinations are too extensive to be published in full.

Koblank, of Berlin, then delivered a lecture upon the permanent results of operations. A definite opinion is only to be passed after four years and the character of a delivery during this time must be taken into consideration. Of the cases observed, 44 per cent. were cured, 34 per cent. were partially cured and the remainder suffered from a recurrence. Part of the failures depended upon neglect of the elongated cervix. Posterior displacement of the uterus plays no part in the etiology of prolapse. Both retroflexion and prolapse are a result of relaxation of the connective and muscular tissues of the pelvis and both do not in any way influence each other. Prolapse in advanced age has the same causes, the disappearance of adipose tissue plays only a minor rôle.

Schauta divides the operative procedures into three groups, viz.: (1) Plastic operations on vagina, perineum and cervix; (2) anterior displacement of the uterus; (3) in advanced cases, excessive antefixation, by anchoring the uterus at the vagina. Of late, Schauta amputates the cervix and shortens the sacro-uterine ligaments, then fixes the uterus to the vesicovaginal septum and finally does a colpoperineorrhaphy. The only disadvantage is that pregnancy will be difficult, hence the ovaries must be removed before the climacteric. Among forty operated cases there was only one recurrence.

Bumm lays down the following rules to be followed in operating: (1) Defects in the perineum and pelvic floor are best remedied by Hegar's colpoperineorrhaphy. Lawson Tait's method is insufficient and carries with it dangers of embolism. (2) The descended or retroflected uterus must be anteflected, preferably by Alexander's operation or ventrofixation. Vaginal fixation causes permanent discomfort. (3) The best permanent results follow total extirpation combined with anterior and posterior colporrhaphy. Indications for total extirpation in women near the menopause are: (*a*) Extensive prolapse with enterocele; (*b*) chronic metritis, erosions and ulcerations; (*c*) disease and tumors of the adnexæ; (*d*) unsuccessful former operations; (*e*) cystitis which cannot heal owing to the cystocele present.

According to Mackenrodt the connective tissue atrophy is due to changes in the pelvic ganglia after trauma due to parturition. Tearing of the levator ani alone cannot be the cause, since wounds here readily heal without any further results.

In accordance with his theory as to the origin of prolapse, Theilhaber pays no attention to the uterus itself but extensively resects the anterior vaginal wall. The posterior wall is operated only where there is also a large rectocele. In primary prolapse, he seeks to fix the uterus merely by narrowing the vagina.

Gebhard describes his method of vaginal ventrofixation. In uncomplicated cases the duration of the operation is only twelve minutes. One of his cases passed through a normal birth and a second is seven months pregnant. He uses a special needle which can be readily procured.

Asch inquires if there is any method which will posi-

tively guard against recurrence. He believes that general treatment is of as much importance as local. If the condition reappears with a subsequent delivery, it must not be regarded as a recurrence since the original causes are then again active.

DODERLEIN speaks at length upon the cause and prevention of puerperal fever. He believes the hands are the most frequent transmittors of germs and warmly recommends rubber gloves in obstetrical practice.

BUMM found that streptococci occurred in the vaginal secretion of 75 per cent. of pregnant women, in a series of primiparæ the figures were even as high as 86 per cent. The tampons used for checking hemorrhage contained the germ in 70 per cent. and the lochial secretion during the puerperium was always infected. The vaginal streptococcus could be distinguished in no way from the ordinary streptococcus of sepsis, though it seemed to be harmless in all cases examined but three. The only explanation possible is that of diminished virulence. The presence of many streptococci on microscopical examination always speaks for sepsis.

OLSHAUSEN agrees that a carcinomatous uterus can be removed more radically by the abdominal route, but does not believe that the vaginal method is never indicated since a permanent cure was achieved in 18 per cent. of cases. The extirpation of glands prolongs the operation and does not give the patient much better chances. Removal of all the connective tissue in the pelvis is as yet a dream. Five years must elapse before a patient is pronounced cured, since recurrence occurs just as often between the third and fifth year as during the first years. Latterly OLSHAUSEN resorts to the abdominal route more frequently, but merely for the better isolation of the ureters.

WINTER performed a radical operation in 57 per cent. of all his cases of uterine cancer. In order to ensure early diagnosis and operation he sent pamphlets to all physicians and midwives of his neighborhood with very gratifying result.

Ligation of the afferent arteries in inoperable carcinoma of the neck, was no more dangerous, according to STOLZ than curettage and cauterization.

In the discussion which followed GLOCKNER states that his mortality with the WERTHEIM operation was only 10 per cent. Accessory injuries occurred in 15 per cent. and suppuration of the skin incision in 22 per cent. Enlarged glands were found in 34 per cent., carcinomatous glands in 22 per cent. The number of recurrences during the first year was not half of that following vaginal operation. WERTHEIM believes that it will only take a few more years before the superiority of the abdominal operation is generally conceded. MACKENRODT thinks it is impossible to avoid injuring the ureters in advanced cases operated from the vagina. The vaginal route is indicated only in very early cases of cervical cancer, provided the cautery is very freely used, to avoid implantation metastases. If the glands are not removed, the abdominal method is hardly as difficult as the vaginal.

GLOCKNER speaks upon pseudopapillary ovarial cysts and states that they are characterized by the presence of more solid portions between the various loculi, so that they make the impression of solid tumors. Microscopically these portions are septa formed by epithelial protrusions into the connective-tissue walls of the smallest cysts. The cell secretion is very small compared with the cell-proliferation. In the speaker's seven cases the clinical diagnosis of malignant tumor was made and the second healthy organ was also extirpated.

SEMON employed scopolamin hydrobromate with morphine to produce anesthesia, in 52 operations. On the whole, he is well-satisfied and has never met with any accidents. In order to deepen the narcosis, a few whiffs of chloroform were generally found necessary. The advantages of the combined method are absence of all excitement, small amount of chloroform necessary, absence of pain even for some time after the operation, absence of nausea, vomiting and albuminuria.

KRONIG then demonstrated an ether-chloroform apparatus, combined with a Bennet inhaler.

Based upon 110 gynecological and 17 obstetrical operations, performed with spinal anesthesia, STOLZ states that (1) spinal anesthesia is in most cases sufficient for gynecological cases. Operations upon the external genitals require 0.05, laparotomies 0.07 to 0.08 grams of tropacocaine; (2) the analgesia lasts one-half to one hour and the deeper sensory segments remain anesthetized longer than the higher ones; (3) narcosis with spinal anesthesia is brought about more rapidly and with less excitement than without it; (4) spinal anesthesia is not followed by complications, if 0.05 to 0.07 grams of tropacocaine, dissolved in cerebrospinal fluid are employed.

SCHRÖDER relates his extensive experience with the intertrochanteric diameter in pelvic measurement. He regards it as absolutely without value.

STÖCKEL gave a general review of the different ureteral lesions and their therapy and goes into the details of ureteral implantation. The intraperitoneal method is followed by the best results.

After discussing the historical development of our knowledge of cystitis, BAISCH goes into the details of the clinical symptoms of the postoperative form. In fully 50 cases the *Staphylococcus albus* and *aureus* were found present. Streptococci occur only rarely but there is almost always a secondary invasion of colon bacilli. The germs are derived undoubtedly from the urethra since staphylococci and colon bacilli, invariably occur in the urethra of operated women. A partial freeing of the bladder from its surroundings is all that is necessary to permit the germs to gain access and set up an inflammation. To avoid this, the bladder should be catheterized as rarely as possible. By injecting 20 per cent. borated glycerin into the full bladder on the evening of the operation, the urine will generally be voided spontaneously.

The systematic palpation of the sacro-uterine ligaments permits of an exact topographic-anatomical diagnosis and should form an important part of every accurate gynecological examination, according to the paper of SELLHEIM. These ligaments form the best means of distinguishing between parametritis and intraperitoneal tumors and between intraligamentary tumors and such that have grown into the free peritoneal cavity.

According to HEINRICH, the injection of caustics into the uterus, sets up contractions which may force the fluid through the tubes. He therefore devised a new instrument, which not alone introduces the fluid but also permits it to escape at the os. In corporeal endometritis, HEINRICH prefers 10- to 20-per-cent. solution of formalin, in cervical endometritis, 50-per-cent. solution of chloride of zinc and in chronic gonorrheic endometritis without adnexal disease 1 to 10 per cent. silver nitrate every eight to fourteen days.

That there is a close relation between nose and uterus is the firm conviction of OPITZ. In animals the sense of smell may lead to sexual activity and probably to uterine contractions. The same probably holds true to a less extent in man and dysmenorrhea accompanied by abnormally severe pains may possibly be a reflex neurosis starting from the nose.

AMANN believes that vaginal instead of abdominal operations are often performed because abdominal ruptures are feared. It is of the greatest importance to

bring together the muscles and fasciæ after a laparotomy and the nutrition and innervation of the muscles should not be interfered with. A special suture is mentioned which has given excellent results during the last seven years.

Schaller recommends large doses of castor oil for post-operative ileus.

The final paper was by Burckhard, who spoke at some length upon the retrogressive changes in the puerperal uterus of the mouse. The placental site is again covered by epithelial cells by the active mitosis of the cells covering the surrounding mucous membrane. The glands which have lost their connection with the lumen send off new diverticulæ, which are at first solid and later develop a lumen and open upon the free surface.

## SOCIETY PROCEEDINGS.

### NORTHWEST MEDICAL SOCIETY OF PHILADELPHIA.

*Stated Meeting, Held July 14, 1903.*

William Egbert Robertson, M.D., in the Chair.

**The Etiology of Cholelithiasis.**—This paper was read by Dr. Wm. Egbert Robertson, in which he gave a résumé of the history of this condition, stating that but very little had been learned of its etiology since it was first mentioned, about 1570 or 1580. He referred to the fact that obstruction of the common duct would give rise to jaundice, may or may not produce colic and may be discovered only at the post mortem. The stones may vary in size, color, shape and weight, and a catarrhal condition of the gall-bladder and ducts usually precedes the formation. Elevation in the temperature of the liver may give rise to the formation of these concretions, as may also paracelsis, and deposition of the bile salts. The paracelsis may occur as a result of errors in diet, and is frequently due to faulty metabolism. The complications of the possibility of perforation and escape into the peritoneal cavity, and develop peritonitis, or else ulcerate in the intestines were also known. He went into some detail as to the composition of gall-stones, and referred to the fact that when they occur in numbers they are apt to be faceted. He believed that they grew by the addition of strata after strata, which accounted for the indifferent substances sometimes found in different layers of the same stone. He referred to the fact that conglomerate stones are not common in human beings but are not at all rare in animals. He also called attention to the possibility of the formation of these stones in the ducts from the fact that they had been found in animals without any gall-bladder. He referred to the fact that micro-organisms could always be found in these cases and believed that in many instances the formation of the gall-stones could be directly traced to the micro-organism and the consequent deposit of the bile salts and other matters in the gall-bladder and ducts forming the stones, aided by faulty metabolism and gastro-intestinal disturbances.

**Diagnosis of Gall-bladder Disease.**—Dr. J. Thompson Schell read a paper with the foregoing title. He said that the disease depended (1) on the location of the inflammation of stone; (2) on the degree and character of the inflammation; and (3) on the size of the stone, the symptoms varying from those of pronounced jaundice to obscure and in some instances no symptoms at all. Acute catarrhal jaundice, with history of gastro-intestinal disturbance, bile pigments in the urine, slow pulse and no symptoms pointing to acute yellow atrophy or malignant disease, occurring in young adult life is probably one of the most characteristic cases. When the symptoms occur in a patient over thirty years of age, pain similar to gall-stone colic may be caused by the expulsion of plugs of mucus, which can probably be detected by washing the stools, although some assert that the gall-stones may be dissolved in the intestines. Chronic catarrhal cholangitis may be caused by obstruction of the common duct either by gall-stone, malignant disease or pressure on the outside, and may extend into the minutest ducts of the liver. The important symptom is continuous jaundice and the course of the infection is that of hypertrophic cirrhosis. Suppurative cholangitis usually follows upon an attack of catarrhal inflammation, and is usually associated with gall-stones, either in the ducts or bladder. The symptoms are remittent chills and fever, grave constitutional symptoms resembling sepsis, enlargement of the liver, colicky pains and jaundice, which are not so marked as in the catarrhal form. In both forms the blood should be examined to exclude the possibility of malaria. This disease is often difficult to differentiate from abscess of the liver. In abscess of the liver, there is progressive and rapid emaciation and anemia, extreme tenderness over the liver, high and intermittent temperature, rarely jaundice; in suppurative cholangitis, there is a history of biliary colic, transient jaundice and no enlargement except in severe cases, while in abscess of the liver enlargement is a prominent symptom. Cholecystitis he divided into three classes, acute, subacute and chronic, with or without associated gall-stones. The acute variety is usually caused by micro-organismal infection, and he believed the differentiation between the calculous and the non-calculous forms to be possible, but as operative treatment would be demanded in any event, felt that the distinction was of little importance. The symptoms are acute paroxysmal pain in the right hypochondriac region, sometimes in the epigastric or iliac region, followed by nausea, vomiting, abdominal distention, rigidity, tenderness and constipation. The diseases most frequently mistaken for acute cholecystitis are acute intestinal obstruction, appendicitis, acute pancreatitis and perforating gastric ulcer. If the patient has a marked temperature rise, intestinal obstruction can usually be excluded, as the temperature does not usually rise in that condition prior to the development of peritonitis. As to appendicitis, this is the most difficult condition to differentiate and frequently can only be accomplished by an exploratory incision. In acute pancreatitis the pain is usually more and is on the left side, instead of the right, and tenderness, or a tumor, when present, is more superficial in cholecystitis than in pancreatitis. The location of the pain and rigidity are the only differentiating guides between cholecystitis and perforating ulcer of the stomach or duodenum. Cholelithiasis occurs mainly in women—sixty-five per cent. to seventy-five per cent. of all cases usually between the ages of forty and sixty years and rarely under twenty-five years, gormandizing, sedentary occupation, constipation, tight lacing, all act as predisposing causes. The premonitory symptoms, such as constipation, flatulency, loss of appetite, vertigo, tinnitus aurium, migraine, icteroid tinge and scanty dark urine should be carefully considered, as should also the character of the pain, the presence or absence of vomiting and shock, and the condition of the pulse and temperature. Jaundice is an unreliable symptom, and while the urine usually shows bile pigment, it will not do so unless there is some jaundice present. In obstruction of the cystic duct, unless it is absolute, no discoloration of the symptoms may occur. The local physical signs are of great importance and must be carefully considered. Tumor of the gall-bladder, when present, is a great help in making a diag-

nosis. In acute obstructions of the cystic duct a typical tumor is usually found, being round, smooth and elastic and when palpated and pushed away from the abdominal wall will return to the examining finger as if swung on a pendulum. In chronic cholecystitis with adhesions one will sometimes be able to find an irregular mass in this region. The gall-bladder tumor responds to respiration; crepitis can be sometimes but rarely felt, and if Reidel's lobe can be felt with its sharp edge lying across the tumor it is pathognomonic of gall-bladder disease. Among the conditions which we are frequently called upon to exclude in a diagnosis of gall-bladder disease are gastralgia, non-perforating gastric ulcer, intestinal colic, malarial fever, carcinoma of the gall-bladder and movable kidney.

**Treatment of Cholelithiasis.**—This paper was read by Dr. Wilmer Krusen, in which he divided the treatment into (1) surgical, and (2) medical, the latter being divided into (*a*) treatment during the attack and (*b*) prophylactic measures indicated during the interval. The objects sought during the attack are relief of the pain, relaxation of the spasm in order to permit the passage of the calculi, and limitation of the inflammation and congestion of the gall-ducts and liver, which he recommended be accomplished by (1) morphine and atropine hypodermatically; (2) general hot bath and hot fomentations over the hepatic region; (3) in aggravated cases, ether or chloroform to a mild degree of anesthesia, in order to relieve the pain; (4) digital manipulation and (5) saline purgatives. The treatment during the intervals should be directed (*a*) to the solutions of the gall-stones present and (*b*) to preventing the formation of new concretions. The value of the first method he thought was rather problematic, although the Durand remedy of ether and turpentine, and also olive oil, had been quite extensively used. For the prevention of the formation of the stones, one to two drams daily of sulphate or phosphate of soda, and alkaline mineral waters were recommended. A review of the history of gall-bladder surgery was given and early operation deemed to be imperative for the best results to be secured. After referring to the five different operations, (1) cholecystotomy, (2) cholecystectomy, (3) choledochotomy, (4) cholelithotrity, and (5) cholecysenterostomy, which were open to the physician, he described in detail the process of cholecystotomy, which he felt was the operation for most cases, being the simplest, although the presence of a stone in the cystic duct may render necessary the performance of either a cholelithotrity or a choledochotomy. He felt that the wound should not be completely closed but that a rubber drainage tube should be inserted for eight or ten days after the operation, a few days after which a pad may be placed over the sinus, and if bile appears in the stools, a firm pad and strapping will aid in early closure. Cholecystectomy he believed had certain advantages, viz., (1) a radical cure of the cholecystitis and gall-stones by removal of the nidus of infection and calculi; (2) avoidance of biliary fistula; (3) a perfectly clean operation with no soiling by infected bile; (4) avoidance of adhesions; but he felt that the great mortality reported by this operation was a powerful argument in favor of the more conservative procedure, except in cases where the gall-bladder is the seat of suppurative changes, or neoplasms, or when the cystic duct is permanently obstructed. In cases of common duct obstruction, when the removal of the cause is impossible, such as cancer of the pancreas, then the union of the intestine to the gall-bladder, as suggested by von Winiwarter, is of advantage. Five cases were reported, the first being a case of spontaneous rupture of the gall-bladder, after about a week's illness of pain and swelling in the hepatic region, biliary vomiting and moderate rise in temperature, during which time salines and calomel had been administered. A cholecystostomy was done, the cavity cleaned out with gauze sponges; the gall-bladder incised and irrigated and a quantity of biliary sediment evacuated; drainage established for about ten days, and the man made a good recovery. The second and third cases were both those of stones impacted in the cystic duct and both had been primarily diagnosed as appendicitis. In each case four gall-stones were removed, and in each instance one was impacted within the duct; a drainage tube was inserted in each case and both made good recoveries, although one was complicated by an attack of biliary fever, lasting about a week, with a temperature of 103 to 104° F. In the fourth case, appendicitis had been diagnosed, but upon opening the abdomen, no disease of this organ was discovered and the wound was closed without further investigation. Two days later the symptoms had increased in severity, the temperature was 103 to 104° F.; pulse 140; evidences of beginning peritonitis were present and there was a distinct mass perceptible in the gall-bladder. Immediate operation was performed; empyema of the gall-bladder discovered, the pus evacuated and 420 gall-stones removed, but the patient died in a few hours. The discussion was opened by Dr. H. C. Deaver. He believed that the infection was in most instances mild in the beginning, and that frequently cases complaining of vomiting and pain in the upper portion of the abdomen would be found upon careful examination to display more or less tenderness and rigidity in the region of the gall-bladder. Previous history he believed to be an important factor in the diagnosis, but jaundice is so often absent that but little confidence can be placed therein. The differential diagnosis between appendicitis and cholelithiasis is sometimes difficult, but in the latter condition, the fever and vomiting are usually more persistent than in the former. Chronic obstruction of the gall-bladder or enlarged gall-bladder is sometimes mistaken for movable kidney. He believed that the cases that could be benefited by medical treatment were the cases that were diagnosed early, and if the stones were already in the bladder, medical treatment was not only useless but to delay radical interference was dangerous.

Dr. Samuel Wolfe remarked on the fact that there seemed to be very few statistics in this disease from American workers. In the formation of the gall-stones, he believed there were two elements present: (1) A local inflammatory element and (2) a constitutional element, which he felt was evidenced by the fact that gall-stones were more frequently found in people in whom the functions of life were not being very actively performed. In regard to the relation of carcinoma, he felt that probably the carcinomatous condition of these parts was more often the cause of the gall-stones than were the gall-stones the cause of the carcinomatous conditions. In the diagnosis of the condition, he believed careful abdominal inspection and palpation, paying particular attention to any tenderness or rigidity would lead to an early diagnosis in many of the cases. Medical treatment, other than prophylactic, he believed, was of no avail.

Dr. Charles S. Barnes referred to the fact that Ricketts, of Cincinnati, recommended the opening of the duodenum when the stones were impacted in the common duct. He also referred to the importance of early recognition of the condition and prompt operative treatment and referred to the practice of Dudley, of New York, of aspirating the bladder and injecting formalin in infective cases.

Dr. T. Turner Thomas did not believe that if the

gall-stones were the result of infection they could be present without some signs of sepsis. He felt that gall-stones which are local in origin are the results of infection, but that those that are of constitutional origin are the direct results of inflammation or irritation in the gall-bladder. In regard to the diagnosis of gall-stones he called attention to the fact that the classical symptoms are sometimes absent, and particularly is this the case with jaundice. Operation, he believed, should be done early. He referred to the exceedingly small mortality of the operations, varying from about 15 per cent. in the hands of the average operator to as low as 1 per cent. reported by Mayo Robson and Corey. He referred to the difficulty of differentiating between enlarged and movable kidney and gall-stones, abdominal colic, pain and gastro-intestinal disturbance being present in both. In movable kidney, however, the pain extends down toward the testicle, while in gall-bladder disease it extends up the back and toward the right shoulder, and rigidity and pain are important factors in diagnosis.

Dr. William E. Parke laid especial stress upon the importance of early diagnosis and operation, and even although the exact condition present was not diagnosed, he believed an explanatory operation was warranted. He reported the case of a woman aged fifty-one years, who had suffered from severe abdominal pain, necessitating the employment of hypodermics and the icebag. The pain was relieved in a very short time, and she got fairly well, with the exception that she had a most persistently coated tongue. The case was viewed as appendiceal colic, and operation expected to be performed later. About two weeks later a similar attack occurred; there was no jaundice and nothing could be felt except rigidity. She was treated medically by salines, etc., for three or four weeks, without relief, when the conclusion was reached that she was suffering from gall-bladder disease and operation advised. Upon opening the abdomen a cancerous nodule was found in the liver, and the patient gradually grew worse and died.

Dr. Wm. Egbert Robertson in closing stated that the reason the statistics were so much greater from Europe than in this country was due to the fact that the opportunities for post-mortem work were much greater.

Dr. J. Thompson Schell reported the case of a woman four months pregnant, who gave a history of repeated attacks of gall-stone colic. She suffered from abdominal pain, rigidity and the movable mass in the region of the gall-bladder, which had been diagnosed by the attending physician as gall-stones. The abdomen was opened and a small ovarian cyst about the size of an orange removed, since which time there has been no evidence of gall-stones or any trouble whatever with the gall-bladder.

## PHILADELPHIA OBSTETRICAL SOCIETY.

*Stated Meeting held May 7, 1903.*

The President, J. M. Fisher, M.D., in the Chair.

**Exhibition of Specimens.**—By Dr. L. J. Hammond, who said that many of these specimens casually observed present nothing of unusual interest. They have all, however, to him an unusual amount of interest, because of the complications surrounding at least two of them, making what otherwise seemed to be a perfectly clear condition, one of uncertainty, until the actual condition was revealed at the time of operation. The first specimens he exhibited were two unusually large tubes and ovaries which represent rather unique specimens of gonorrheal pyosalpinx, clinical diagnosis being confirmed upon microscopical finding of the gonococci in the pus removed from the severed end of the tube. It is extremely rare to be able to demonstrate the presence of the gonococci in the pus found in the tubes, this being the first case in which he has ever been able to secure positive evidence. The second specimens are quite unique. They were removed from a woman sixty-two years of age, and, as will be noted, they are unusually large, especially the left one with the anterior surfaces smooth and somewhat irregular in outline, while the posterior surface is ragged, showing adhesions of the entire posterior surface to the parietal peritoneum. It was absolutely necessary to quarry them out from the deep tissues in which the posterior surface was firmly imbedded and adherent. Their stony hardness was most pronounced. Microscopical examination shows them to be true enchondroma. The case is therefore one of bilateral ovarian enchondroma. He has not been able, in a rather superficial investigation of the literature of the subject, to find any authentic case of pure enchondroma recorded. The patient, in addition to the six intra-abdominal growths, had also five enlarged perirectal glands which were in size from that of a nutmeg to a hulled walnut. These have since broken down and presented, microscopically, a few weeks ago, a suspicious appearance of malignancy. They were not subjected to microscopical examination and he cannot therefore positively state their true nature. The patient's health, however, is excellent. The third specimen exhibited, so large that he is unfortunately unable to remove it from the jar, is, aside from being an unusually large fibroid, not of special interest at this stage. It is presented in order that he may bring out an unusually interesting feature in connection with the question of diagnosis that presented itself to him when the tumor was exposed through the abdominal incision, that is, an immense hematoma, which, as will be seen by the dark area over the anterior surface of the tumor, was the first point presenting itself through the abdominal incision, and the question at once arose whether the condition was not one of cyst. Of course, this was readily negatived on tapping, when the true character of the contents was revealed. The diagnosis was fibroma before operation. The patient made an entirely uninterrupted recovery. Another point of considerable interest to me in this specimen is that the anterior and lateral portions of the uterus are alone the seat of this myomatous change. The posterior portion of the uterus seems to be entirely free from the growth. The patient from whom this growth was removed was forty-two years of age and had borne one child nineteen years ago. The next specimen shown, of such great size that it is somewhat difficult to handle, was removed from a woman thirty-two years of age, three weeks after birth of her eighth child, at full term. The case was seen in consultation with Dr. West, who had no knowledge of the patient previous to the present confinement, nor could the patient give any intelligent idea as to whether the growth existed before pregnancy, or whether it sprung up during its course. The only information she could give was that her stomach had been very large for a year or more previous. The entire abdominal walls were stretched to their utmost extent, bringing out very conspicuously the distal veins. The presence of fluid could be determined in about the same way as it would be in a general ascites. None of the usual points of dulness observed in ovarian tubes were present. The flanks were distended as they would be in general abdominal ascites. On the left side and extending as far up and beneath the ribs as could be felt was a hard mass, as is shown in the specimen, extending down to the crest of the ilium, and across to about the median line on the left side. With the exception of the markedly dull area overlying this hardened mass, resembling most noticeably an enlarged

spleen, the entire abdomen seemed filled with fluid from within its cavity. Vaginal examination showed the cervix in a normal condition for three weeks after labor. The vaginal vault was markedly convex outward, and pronouncedly tense. The woman presented the characteristic fascia ovariana so aptly described by Sir Spencer Wells. Though this peculiar expression is also found in cases of long standing abdominal ascites, he had, of course, in mind the probability of its being ovarian cyst, though the large mass recognized as decidedly myxomatous made him undecided, and determined him to give some weight to the thoughts of its being a splenic ascites. Of course, this possibility was at once set aside after incision was made. An unusually long incision, extending from the umbilicus to the pubes was necessary to deliver the sac after the fluid, which was rather thick and chocolate colored, had been withdrawn. The wall of the cyst was adherent throughout the entire parietal peritoneum anteriorly, laterally and posteriorly, also to the liver, transverse colon, stomach, spleen and diaphragm, the intestines occupying but an incredibly small space posteriorly. The growth contained more than three gallons of this chocolate-colored fluid, weighed 110 pounds, and the adhesions were the most extensive that he had ever undertaken to break up. The abdomen was drained for forty-eight hours, the patient making a perfectly natural recovery. This myxomatous mass that is seen occupying the left side of the sac is very like in shape to the spleen. It is certainly interesting to him in showing how excusable it would be to at least give serious thought to the possibility of hypertrophied spleen with ascites, especially when one remembers that this cyst wall was so firmly adherent throughout, above, laterally and below that it gave no symptoms different from what would be found in a general peritoneal ascites. The case was, however, one of left-sided ovarian cyst. The rather ignorant subject from whom the specimen was removed prevented his arriving at any conclusion as to whether it developed during the course of the last pregnancy or had been much longer present. From the extensive and well-organized adhesions, however, he is strongly disposed to the belief that it had probably been present during her former pregnancy.

**Placenta Previa with Transverse Position.—Manual Dilatation.—Podalic Version.**—This subject was presented by Dr. Wilmer Krusen, who cited the following case of placenta previa, which, he thinks, is of sufficient interest to be reported, if only to stimulate discussion upon the treatment of this most serious complication of pregnancy: Mrs. McC., aged thirty-four years, IX-para; was first seen with her physician, Dr. John McCormick, on Jan. 6, 1903. The diagnosis of placenta previa had already been made. The patient had been bleeding irregularly for five weeks. Her general condition was good, and the pregnancy was about at term. The hemorrhage had been quite profuse. On examination, the fetus was found in a transverse position; head to the left of the mother's abdomen and the back anterior. The cervix was softer and more succulent than usual. The os was slightly dilated, so that little difficulty was experienced in passing a finger through the cervical canal and feeling the characteristic sponge-like placental tissue above. As the patient had refused to enter any maternity hospital, it was determined to treat the case at her home as well as the environments would permit. On January 7, under ether anesthesia, after the usual careful antiseptic preparation, rapid manual dilatation and podalic version were performed with speedy delivery of the child. The dilatation of the os was easily accomplished, as the woman had borne nine children and had a roomy birth canal. The hemorrhage during the detachment of the placenta, which was centrally implanted, was exceedingly profuse. A gush of blood, resembling the outpouring from a fireplug, deluged the obstetrician. The right anterior leg was brought down first, followed in a few seconds by the other, and the buttocks temporarily controlled the hemorrhage. The child was speedily delivered, although in extracting the arms the right humerus was broken. As the uterus was much relaxed the placenta was immediately delivered manually. The anesthetic was withdrawn and by vigorous external and internal manipulation, by irrigation with hot normal saline solution and a tampon of iodoform gauze, uterine contractions were excited. The patient's condition was excellent, no shock was noted, the pulse was full and strong, running from 75 to 80. The child was perfectly developed and although slightly asphyxiated, was easily resuscitated. As the mortality for the children in placenta previa is over 50 per cent. and increases as the placenta is more centrally situated, the saving of the child was particularly gratifying and could not have been secured, had there been the slightest obstruction or delay in delivery, as the placenta was perforated and almost completely detached some seconds before the birth of the child. The subsequent convalescence of both patients was uneventful. This case illustrates the value of terminating pregnancy in a most conservative manner as soon as possible after a placenta previa has been positively diagnosticated, without waiting for the onset of labor, or subjecting the patient to the danger of hemorrhage in the absence of a physician. By having trained assistance and all facilities at hand for the treatment of hemorrhage and shock, the best interests of the patient are assured. In this case the multiparity of the patient and the roomy birth canal rendered the manual dilatation extremely easy. In other patients, under other circumstances, it may be necessary to employ some mechanical method to effect dilatation such as the Champetier de Ribes balloon or the Bossi dilator; but he believes it will rarely be advisable to perform Cæsarean section in the treatment of these cases.

Dr. Stricker Coles, in discussing this subject, said he was very glad to hear of the success of Dr. Krusen with his case of central placenta previa, having saved both the mother and the child. This subject has greatly interested him for some time, but he has not been able to get satisfactory statistics, as most papers do not clearly define the different varieties of placenta previa. The mortality of the lateral, marginal and partial varieties should not be considered with that of the central variety. The first three can be treated by rupturing the membranes and saving in many cases both the mother and the child, so that he will limit his discussion entirely to that of central placenta previa. In a great many cases of central placenta previa, the bleeding comes on early, at about the fifth month, before the child is viable, and in these cases the life of the child is of course not to be considered, and the case is best treated by version and slow extraction. In cases where the child is viable one comes across two conditions: The first is where there has been considerable hemorrhage and the life of the child is lost or so nearly lost that a radical operation would not be justifiable, and these cases would be best treated with version and the slow extraction of the child. But in those cases where the child is viable and nearly at term and there has not been a severe hemorrhage and the child is in good condition, one has to consider both the life of the child and that of the mother. He believes in treating these cases, if the patient is a multiparous one, where the cervix can be easily dilated and the vagina is large, these cases would probably be successfully treated with version and rapid delivery, trying to save both the mother and the child: but one must always remember that

where rapid version is done and attempt is made to save the life of the child, at the same time the danger to the mother is increased, due to the lacerations of the cervix, which is soft and vascular and will increase the danger of post-partum hemorrhage, because the muscle fibers of the cervix have been torn and paralyzed. Central placenta previa does not very often go to full term, but if he should see a patient with the central variety where the cervix is not easily dilated and the vagina is small, whether it be a primiparous patient or one that has had only two or three children, he should certainly advise such a patient to have Cæsarean section, and for two reasons: First, for the sake of the child, as one will hardly be able to deliver the child quickly enough to save its life in more than 25 per cent.; and second, for the mother, to lessen the danger of post-partum bleeding. He would in this case do celiohysterectomy unless there were some special reasons for the removal of the uterus. Where the child is removed through the uterus, there is not so much danger of hemorrhage, as the cervix has not been torn, and he does not think it is necessary in these cases to remove the uterus. If necessary to control hemorrhage, one can pack the uterus with iodoform gauze. In conclusion, version should be performed in those cases where the child is not visible, and where the child is dead, or its life is endangered from severe hemorrhage, and where the cervix is easily dilated and the vagina is large. In those cases where the cervix is not so easily dilated and the vagina not large, and the woman has not had a severe hemorrhage and the child at or near the full term of gestation—under such conditions, he thinks, Cæsarean section should be employed.

Dr. George M. Boyd said that Dr. Krusen is to be congratulated upon the result in this case. To deliver a patient with central previa successfully and with a living child, he thinks is a great feather in his cap. It shows his dexterity and ability in performing version. He agrees with Dr. Coles in regard to the treatment of a few cases of placenta previa that will come under their care; that is, treatment of placenta previa centralis by Cæsarean section. About a year or two ago he expressed his opinion on this subject in a short paper before the County Medical Society, and he remembers, in the discussion of that paper, the consensus of opinion was opposed to Cæsarean section for even placenta previa centralis. Each case, he feels, must be a study in itself. In marginal placenta previa, manual dilatation and podalic version, it seems to him will serve best. In his own experience it had seemed wiser, after performing podalic version, to treat that case as a breech presentation rather than rapidly extract the child. For the majority of cases of placenta previa manual dilatation and podalic version will serve best. He agrees with Dr. Coles in the stand that he takes: it does seem to him that there are a few cases that probably would be better treated by Cæsarean section; and those few cases he would limit to central implantation of the cervix in the primiparous patient and in a patient where there exists a rigid cervix—a cervix that can only be dilated with difficulty. There have been a number of papers written upon the subject pro and con, and the majority, he thinks, have opposed section for the treatment of placenta previa. One criticism has been the fact that in the majority of cases there has existed some hemorrhage before one sees the case. Another criticism is that some cases are already infected. Another is the fact that in many of the cases the pregnancy is not at term and the child will hardly live, even if delivered by Cæsarean section. The course that he believes should be followed in all cases of ante-partum hemorrhage should be with the first hemorrhage to anesthetize the patient and make a careful diagnosis. If the patient is suffering from a marginal or lateral implantation, manual dilatation and eversion will suffice; if, however, the placenta is centrally implanted and the patient primiparous, the cervix rigid and difficult to dilate, the patient at term or near term, he would feel it his duty, after she has come out of the ether, to place the situation plainly before her and give her the chance of Cæsarean section should she prefer that operation.

Dr. Oliver Hopkinson said that Dr. Krusen must be congratulated upon the happy ending of his case. He believes in placenta previa the lives of the mother and child are antagonistic; trying to save both, you are apt to lose both. He would like to ask the Doctor how he made the diagnosis of central placenta previa, which he thinks can only be made after full dilatation of os. The treatment in cases of the variety described to-night is version followed by slow extraction. He believes it safer to bring down one foot only, giving the uterus time to contract and retract. The great temptation in these cases is to hurry extraction, producing a post-partum hemorrhage, which may seriously jeopardize the life of the mother. In reference to Cæsarean section he thinks its field of usefulness is very limited. With rigid os and mother and fetus in good condition it could be considered, especially if one fears a centrally located placenta.

Dr. L. J. Hammond said his experience in the treatment of post-partum hemorrhage has been rather larger than he expects it will ever be again; since his work nowadays is not so largely obstetrical; but the difficulty he has always experienced has been in the early diagnosis of placenta previa—in this respect fully agreeing with what has been said by Dr. Hopkinson; or at least with him it is extremely difficult, and in a large percentage of the cases it has been impossible for him to say that any given case was one of placenta previa, either centrally or laterally, until after the cervix was dilated sufficiently for him to determine it by digital examination. When he finds he has a condition to deal with of placenta previa he at once anesthetizes the patient and undertakes a rapid dilatation. He has never found any difficulty in getting rapid dilatation, because in every case, to the best of his recollection, that he has ever seen, it has been at full term, the woman having been in labor has consequently lost considerable blood, and through having lost this blood the tissues are readily relaxed, enabling dilatation, not alone of the cervix, but also of the entire birth-tract to be decidedly easy of accomplishing. Before active uterine contractions begin the bleeding can always be controlled by thoroughly tamponing the vagina with sterilized gauze. This, in addition to controlling hemorrhage, stimulates active uterine contractions. So, he has never had any difficulty in this direction, *i.e.*, in the dilatation. If uterine contractions are not strong, he, after securing the feet, brings one foot down as a tampon, after which he contents himself to wait until the cervix is sufficiently dilated to extract the child. He has never, to the best of his recollection, had a fatal termination from placenta previa. He has seen one or possibly two fatal cases when students had been in attendance, the condition not having been recognized sufficiently early. In his own practice he does not remember ever having lost a case, and that has been his method of procedure. Personally, he does not see how it is possible to make a diagnosis weeks or months before the labor begins, unless the cervix be dilated to such an extent as to precipitate labor prematurely.

Dr. Krusen, in closing, said he would like to say one or two words about the case in point. This patient was a very favorable case. She was one of those Irish women, in the habit of having their children easily. The babies had been almost ready to drop out of the birth

canal. The delivery was performed in three or four minutes. The legs could be grasped with the greatest of ease. There was no particular skill required in perfecting version. As to why he is certain this case was one of central implantation—it being suggested by Dr. Hopkinson as possibly an error in diagnosis—the method of making the diagnosis was something like this: In dilating the cervix, the more he dilated the more he found that the orifice was covered with the placenta. He started in with gradual dilatation, getting one finger in early, and later the entire hand and found as he dilated the os, the os was still covered with placental tissue; so he felt confident of his diagnosis. At last he despaired of getting around the edge of the placenta and so perforated it and quickly accomplished the version. In regard to teaching the Cæsarean section as a method for treating placenta previa, he thinks they should be very careful as an obstetrical society. In the hands of such accomplished obstetricians and operators as Dr. Coles, Dr. Boyd, Dr. Hopkinson and others, this is practically a successful method of treatment; but, if they put themselves on record as advocating the treatment of placenta previa by Cæsarean section, they are going to sacrifice not only the lives of the children, but very often the lives of the mothers. When they can have statistics presented showing 107 cases in one series by four practitioners with only one death, it is a question whether they ought to advocate this method ever in the treatment of placenta previa. To go back again, these very gentlemen admit themselves it is impossible to make the diagnosis of a central implantation. If they can show the case is a primiparous woman and has a centrally implanted placenta, then Cæsarean section is indicated; yet, in the next breath they tell us, "You can't tell the variety until labor starts." Now, for the point to which Dr. Boyd called attention, the one point which covers the whole substance of the matter; that is, that each case is a law to itself. One may have a case in the maternity hospital with all the modern appliances; one may have one in a little two-story house, another away off in a farm-house. In each case you must serve the interests of both the child and the mother by using the method best adapted to that particular case and its environment.

**Uterine Fibroma Near the Menopause.**—This was the subject of Dr. George Erety Shoemaker, who said that the medical heresy is passing away, that fibromas grow less, stop bleeding, or do not develop at the time of the menopause. An experience of many years in dispensary and hospital has failed to show a case. On the contrary, peritonitis, pyosalpinx, pressure on urinary organs, hemorrhage kill or forever impair vitality in many who are waiting for a menopause which never comes. Three more cases illustrate onset of severe symptoms after the age of forty-four years:

*Case I.*—Widow, aged forty-four years; married ten years; never pregnant. Within three years periods have become almost constant. Last two months in bed from severe hemorrhage, getting worse. Hemoglobin 45 per cent. Tumor choked pelvis, reached three inches above navel. Removed by ligation. Aseptic recovery. A year later reports herself "splendidly well."

*Case II.*—Single woman, aged forty-seven years. Hemorrhage increasing under her physician's treatment, two years. Now soaks 10 to 12 large napkins per day during long and frequent periods. Dyspnea. Chronic interstitial nephritis. Has had phlebitis in legs and thighs. Weight 215 lbs. Very short. Tumor five inches in diameter wedged in pelvis. Removed by difficult ligation. Aseptic recovery.

*Case III.*—Widow, aged fifty-one years; three children. Hemorrhage gradually increasing seven years, now almost constant. Fibroma reaching three inches above navel. Operation by ligation easy. Aseptic recovery.

These cases are part of a consecutive series of 19 hysterectomies at the Presbyterian Hospital without a death; also part of a consecutive series of 60 abdominal operations in my service at the same institution, with one death. That death followed a few hours after operation for intestinal obstruction in a patient who had been vomiting thirteen days before I saw her, and had gangrenous intestine with extensive adhesions. The operations included 1 Porro-Cæsarean section, 14 other hysterectomies, 2 extra-uterine pregnancies, a gall-bladder and two kidney cases. The appendix was removed 20 times, 6 of them as a primary operation. Nineteen cases had salpingitis. Pus was present 18 times at the operation, six of these as true pelvic abscess outside the tubes, and not due to appendicitis. There were two tumors of the ovary, etc. Once only was the abdomen opened to suspend the uterus.

Dr. L. J. Hammond said that the cases reported by Dr. Shoemaker are interesting to the Society, especially to the surgeon; and he is to be especially congratulated upon having had so large a series of cases, with practically no mortality. He knows so well the difficulties one encounters in removal of these fibroids, and in fact, most every intra-abdominal pathologic condition. Every year he finds that his work becomes more difficult, and most every case that comes to him seems to bring additional complications to what they did a few years ago. Just why it is so he does not know, unless it be that the easy cases have all been used up—have all been operated on and cured. Within the past few months he has had a series of the most difficult intra-abdominal cases to operate upon that he has ever before had because of the extensive adhesions, etc., that he has had to deal with. These cases referred to by Dr. Shoemaker as being partly intraligamentous are always very difficult; they are difficult to him because of the great depth that ligatures have to be tied and the hemorrhage that one has to deal with so very often, the result of this, and especially if there be, as there so often is, extensive adhesions. He would like to hear from Dr. Shoemaker as to whether these intraligamentous tumors were extensively adherent and his method of securing the vessels under such conditions.

Dr. Geo. M. Boyd said that in one of the cases that Dr. Shoemaker reported he told them that the tumor completely filled the pelvis. He would like to ask Dr. Shoemaker what operation he resorted to in that case. In his experience those cases have been probably the most difficult to operate upon. The course that he has pursued is to tie down upon one side and, boldly cutting across the cervix, ripping the tumor out, catch the bleeding vessels. To tie down on either side before removing the mass has always been a difficult course for him to pursue.

Dr. Krusen said the thought came to his mind while Dr. Shoemaker was reading his paper about how much more radical operators have become in the treatment of fibroid tumors. There seems to be a tendency in recent medical literature to deal with the degenerative changes in fibroid growths. Formerly many specialists told their patients that if they had small fibroids and were near the menopause, operation was not required; but there have been a number of articles contributed lately, and much work has been done by pathologists showing the frequency of sarcomatous degeneration, and this possibly will lead us to teach in the future that fibroid growths should be removed as soon as recognized, whether they are producing marked symptoms or not.

Dr. Shoemaker in closing said he would say in the cases that have not had inflammatory complications he has not generally had a leucocyte count, as he has never

found anything helpful from it under such conditions; but he always has a hemoglobin estimation. Some of these cases have been reduced to a very low point by hemorrhage. They are obliged to temporarily control hemorrhage while they can bring the hemoglobin up to a reasonably safe point. To do this he uses tight vaginal gauze pack with the patient in the knee-chest posture. Renew every third day. He gives mammary extract, five grains four times a day and keeps them in bed. Ice is put on if there is local peritonitis until the patient is in better shape. As to the method of removal, when the tumor is intraligamentary on both sides, he thinks the best they can do is to go down with forceps and ligatures on the best side, and cut away the tumor as fast as possible, catching the arteries as they jump. That is what happened in this stout woman. There is a little more blood lost that way, but one cannot give tumors which choke the pelvis treatment, which is more satisfactory as far as he can find. He has never felt like going down through the tumor with the uncertainty of being able rapidly to ligate.

**Exhibition of Specimen of Fetus Papyraceus.**—By Dr. Stricker Coles. For this case he is indebted to Dr. J. H. Spruance, of Wilmington, who also gave him the following history of the patient: The woman was thirty-five years old, she has had three children and three miscarriages; the last miscarriage being two years before this pregnancy. As near as he could count, the patient was advanced three hundred days gestation. The first stage of her labor lasted eight hours, the second stage two hours and the third stage about an hour and fifteen minutes. The placenta and fetus papyraceus was removed by Credé's method. The child was a male weighing eleven pounds and six ounces, was well developed and was in a perfectly normal condition. He found that the specimen which was delivered on January 11 of this year has been placed in a bottle with mouth so small that it cannot be removed. The condition which he wished to especially investigate was whether there was a complete chorionic sac for both the fetus papyraceus and the child. There are always two amniotic sacs, but of course, in many cases there is only one chorion, but this he could not determine. In both cases there is a velamentous attachment of the cord to a single placenta. This is a rarer condition than where there are two separate placentæ. He should say the fetus papyracens had grown to about the period of three and a half months' gestation before death.

## BOOK REVIEWS.

Tumors—Innocent and Malignant. Their Clinical Characters and Appropriate Treatment. By J. Bland Sutton, Surgeon to the Chelsea Hospital for Women; Assistant Surgeon to the Middlesex Hospital, London. Third Edition. W. T. Keener & Co., Chicago.

There are certain general characteristics of this type of English book which impress themselves at once upon the American reader. The most pronounced is that the author's standpoint is distinctly a scientific rather than a merely medical one. In an altogther charming way he has contrived so to mass the vast wealth of material under consideration that logical and easily retained deductions are the rule thoughout. The book is absolutely free from dogmatism and empyricism. In short, its charm and very great worth lies in the fact that throughout, comparative statements are made. This has been most successfully exemplified in those chapters which deal with congenital deformities, but wherever a prototype of any common tumor exists in plant life or in the lower animals, the relationship is most graphically carried out. As a consequence, this volume must be of the very utmost value to all teachers of pathology and allied branches. Whatever regrets, if any, the reader may formulate in following these most interesting and instructive pages must center upon the author's methods of treatment. One can be forgiven for wishing that the public might profit by his being willing subsequently to devote his attention more strictly to the elucidation of the pathological problems which are so difficult of solution. In their interpretation he has few, if any, peers.

On points of surgical technic he would appear from the text to have at least a number. The hope might therefore be expressed that the next edition may deal more largely with the comparative pathology of tumors, leaving their treatment to the hands of the ordinary surgeon. The book is probably without a peer from the standpoint of the pathology, etiology, symptomalology, and diagnosis of tumors.

Of very special import in this edition is the chapter bearing on the deciduomata which are provisionally classified with the sarcomata. Cheering also is the rescuing of the harmless myelomata from the "banal society of the sarcomata." Not less progressive and clearly indicative of the stamp of the book is the elimination from its pages of the term "epithelioma." It is replaced by the phrase "squamous, called cancer." It might be fortunate for the student and for us all if a further expurgation should liberate us from the word *cancer* altogether.

The book is attractively made, the print being particularly clean-cut and readable. Its makers are to be congratulated on having turned out a perfect volume.

Organic Nervous Diseases. By M. Allen Starr, M.D., Ph.D., LL.D. Professor of Diseases of the Mind and Nervous System, College of Physicians and Surgeons, New York; Consulting Neurologist to the Presbyterian and St. Vincent's Hospitals; St. Mary's Free Hospital for Children and to the New York Eye and Ear Infirmary. Lea Brothers & Co., New York and Philadelphia.

Dr. Starr's work comes to the profession with the weight of authority that instantly stamps it as worthy of the fullest consideration and in the present work before us we find one of the most clear and readable textbooks that it has been our fortune to see. Furthermore, a text-book which, from the illustrative point of view, leaves almost nothing to be desired. It is both fully and beautifully illustrated.

Regarding the subject-matter, it may be said that the consideration of neuritis is almost monographic, the author's many studies in this line having placed him in a position of particular prominence. The articles on the muscular atrophy, muscular dystrophy are very full and unusually lucid; while the discussion of injuries of the spinal cord is brief and presents a summary of modern-day knowledge that can hardly be improved upon. As would be expected, the author's consideration of tumors of the brain is especially illuminating. In view of his wide experience, the general conclusions on the unfavorable outcome in the surgical treatment of brain tumors leaves a sense of disappointment of possibilities coming from so high an authority.

The author's very clear and straightforward style renders the work one of special attraction to the student and practitioner. It is clear-cut and direct and the clinical pictures easily recognizable. Treatment is particularly complete and detailed. From every point of view the work is one entitled to more than ordinary commendation.

# THE MEDICAL NEWS.

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## ORIGINAL ARTICLES.

### INFANTILE SCORBUTUS.

BY THOMAS MORGAN ROTCH, M.D.,
OF BOSTON, MASS.

THE following cases of infantile scorbutus are reported for the purpose of impressing upon the profession the great care which should be taken to differentiate between an advanced bone lesion of this disease and the bone lesions which arise in osteomyelitis and osteosarcoma.

*Case I.*—A boy ten months old was sent to the Children's Hospital on February 8. The family history was negative. He was born at full term. He had been fed on cereal milk and gained in weight until the present illness began and had seemed perfectly well.

For two weeks before entering the hospital the right lower leg seemed tender, and four days before entrance a swelling of that limb was noticed. The child appeared quite ill. He was seen in the out-patient department and sent into the house for acute osteomyelitis.

The skin was pale. There was a marked rosary and enlarged epiphyses of both wrists and ankles. There were two lower middle incisors. The gums were slightly reddened about the base of the teeth, but there was no distinct stomatitis ulcerosa. The heart, lungs and abdomen were negative. The prominent feature of the case was the swelling of the right leg from the knee to the ankle, and this was especially marked above the outer malleolus. The swelling was hard, tense and tender. The skin over it was glazed, but there was no fluctuation. The rectal temperature was 101° F. The blood count at the time of the entrance showed 19,200 white cells.

On February 10 the infant was operated upon. An incision was made through the periosteum and a large blood clot found. The periosteum had been completely dissected off from the tibia. A culture taken at the time of the operation was found to be sterile.

On February 18 a second operation was performed on account of the temperature rising to 103° F. The bone was then found to be loose, and the entire shaft of the tibia came out in two pieces.

On February 28 a third operation was performed, as the child was rapidly growing worse. He had run an irregular temperature and had grown pale. There was an ecchymosis of the size of a quarter of a dollar below the left nipple. The other leg (left) was at this time in a condition similar to that of the right leg on entrance, except that the thigh was chiefly affected, the swelling extending from the groin to the calf. A complete blood examination was then made with the following result: Hemoglobin, 50 per cent.; leucocytes, 27,100; erythrocytes, 2,400,000.

A differential count of the white cells showed: Polymorphonuclear leucocytes, 68.6 per cent.; small lymphocites, 23.2 per cent.; large lymphocites, 7.4 per cent.; eosinophiles, 0 per cent.; myelocytes, .2 per cent.; mast cells, .6 per cent.

The erythrocytes showed marked poikilocytosis. During the count there were seen normoblasts, 15; megaloblasts, 5, showing a severe secondary anemia.

The operation consisted of an incision through the periosteum of the femur. A large blood clot was found and the bone was found to be bare. The child experienced little or no benefit from these operations, but grew steadily worse until March 1, when the surgeons called me in to see the case in consultation. I suggested the diagnosis of infantile scorbutus and ordered orange juice. From that time there has been steady improvement in the condition of the child. Additional purpuric spots appeared on March 20 on each side of the neck, and on April 6 all tenderness had disappeared and the periosteal sheaths were firmer, but had not united to the bone epiphyses. The left leg was still somewhat swollen. The blood count showed a decided change for the better. It was: Hemoglobin, 65 per cent.; leucocytes, 17,800; erythrocytes, 5,080,000. Differential count of 500 cells showed: Polymorphonuclear leucocytes, 67.2 per cent.; small lymphocytes, 21 per cent.; large lymphocytes, 5.8 per cent.; eosinophiles, 6 per cent. Red cells showed very slight poikilocytosis. During the count there were seen only three normoblasts and no megaloblasts.

The child's general condition has improved steadily up to the present time. There are evidences of increased bone formation, as shown by the X-ray. The condition of the blood on May 8 was as follows: Hemoglobin, 80 per cent.; whites, 13,700; reds, 5,370,000. A differential count of 400 cells showed: Polymorphonuclear, 37 per cent.; small basophiles, 43 per cent.; large basophiles, 4.2 per cent.; oxyophiles, 12.6 per cent.; myelocytes, 2.3 per cent.; mast cells, .9 per cent. Stained specimens show very slight poikilocytosis and very slight achromia, otherwise nothing remarkable is seen concerning the reds.

This is presented, not only as representing one of the more severe conditions appearing in infantile scorbutus, but also to show how difficult it is at times for the surgeon to differentiate between infantile scorbutus with subperiosteal hemorrhage and osteomyelitis, also the great value which the use of the X-ray is in such differential diagnosis.

*Case II.*—A boy nine months old came to the out-patient department October 3, 1901. He

had been fed for the first five months on Mellins' Food, and for the last four months on Cereal Milk. His birth-weight was 7½ pounds and his weight at the time of the first examination was 9 pounds, a gain of 1½ pounds in nine months. The family history was negative.

The four weeks before entrance he became fretful and irritable and the lower extremities became sensitive. One week later the left thigh began to swell, swellings appeared just above the ankles and a few days later the right thigh became similarly affected. The swelling of the thighs progressed. The mouth was red and sensitive, while the baby was cutting two lower incisors.

On September 26, about four weeks after the onset of the symptoms, the baby was seen in the out-patient department of the Children's Hospital. It was emaciated. The anterior fontanelle measured 1½ inches. There were two lower incisors and there was a general enlargement of the lymph nodes. The gums showed a slight purplish tinge, but no typical stomatitis ulcerosa. There was a marked rosary. The spleen was just palpable and the liver was palpable two fingers breadth below the costal border. The prominent feature of the case was the marked enlargement of the thighs, in contrast to the emaciated body, especially the arms. The swellings extended from epiphysis to epiphysis, being especially prominent anteriorly. There was no limitation of motion in the joints. The swellings were

CASE I. Infantile scorbutus. X-ray.

apparently connected with the bone; they were hard and tense and somewhat tender, but showed no heat or redness. There was no edema of the subcutaneous tissue. Above the left inner malleous was a similar swelling, much less advanced. The blood showed 7,400 leucocytes. There was no pronounced pallor. The right thigh measured 8¼ inches, the left thigh measured 7¼ inches. The treatment consisted of plain cow's milk, properly modified and orange juice.

*Subsequent History.*—There was was considerable difficulty in adjusting the food to the infant's digestion, but the swelling and tenderness of the legs rapidly diminished in spite of the persistence of more or less indigestion. At the end of four weeks each thigh had diminished nearly two inches in circumference and there remained no evidence of any swelling or tenderness. The weight was still 9 pounds, but from that time the baby began to gain on a fat, 2.50; sugar, 6.00; proteids, 1.00; 15 per cent. alkalinity; 10 ounces barley water in a 40-ounce mixture. Six feedings of 6 ounces, gradually increased to 8 ounces.

In seven weeks the infant had gained 3¾ pounds. The food was then rapidly increased in strength and quantity, and in the following March, 4½ months after the beginning of treatment weighed 17 pounds, a gain of 9 pounds.

The history just given was that of an advanced case of infantile scorbutus. There were certain points in the case, however, which are of great significance. In the first place, before the treatment was begun, the right thigh showed not only considerable enlargement, was unyielding to pressure, and so hard that it strongly suggested the presence of osteosarcoma. The case, therefore, was a difficult one in which to make a differential diagnosis, and it had even been suggested by some who saw the case that an amputation for osteosarcoma would be needed. It is presented as a condition, which, without the use of the X-ray and with the absence of other symptoms of scorbutus and apparent lesions in the other limbs which may occur in infant scorbutus, would make the differential diagnosis between osteosarcoma and subperiosteal hemorrhage very difficult.

CASE II. Infantile scorbutus.

## NOTES ON EXPERIMENTAL SURGERY: A MODIFICATION OF THE M'GRAW ELASTIC LIGATURE.

BY J. W. DRAPER MAURY, M.D.,
OF NEW YORK.

THE following report is of work done by the authorization of the Department of Surgery of Columbia University. Its execution was rendered possible by the courteous co-operation of Professor John G. Curtis, who placed the matchless equipment of the physiological laboratory at my disposal and in every way fostered and furthered the work.

It is scarcely possible to consult any authorita-

tive modern article on gastric surgery which does not deal either with the problem of the relationship of gastric ulcer to carcinoma or treat its subject-matter under the assumption that this relationship is established. The most recent views, indeed, hold not alone that ulceration is the most important etiological factor in the production of malignant gastric neoplasms, but that it is the prime causative factor in the development of the so-called "simple diseases" of the stomach. What future observation will determine to be the actual facts in this matter is an interesting question. Enough is now known, however, to make the operative treatment of gastric ulcer, whether in its acute form or in its late and protean manifestations, one of the most important medical questions of the day.

Two widely different operative procedures for the relief of identical gastric lesions have been introduced almost to the exclusion of others: the one is pylorectomy, the other gastro-enterostomy. Opinion is at present divided as to whether in intractable cases of chronic ulceration, more lasting good will be conferred by pylorectomy, which implies a removal of the ulcer-bearing area and a re-establishment of the channel in its normal position, or by the somewhat more conservative operation of gastro-enterostomy, which, creating an entirely new path for the food, puts the pyloric region out of use, places the ulcer-bearing region at surgical rest and allows it to heal. Inasmuch as there are considerations, both immediate and remote, bearing upon the choice of these operations, some of which are as yet of a hypothetical nature, it does not seem probable that either is likely to supersede the other until these questions shall have been set at rest.

Gastro-enterostomy is frequently accomplished by the well-known "Murphy button." The great utility of this instrument is widely recognized, but, unfortunately, its most ardent advocate cannot say that its use is danger-free. In reply to a recent inquiry, Dr. John A. Wyeth writes that he was obliged to re-operate not long since, 120 days after he had used a Murphy button in doing a gastro-enterostomy. After gastrotomy and removal of the button from the stomach the patient died. Numerous similar instances are recorded of disaster due to the retention of the button after it had successfully accomplished its work. Nor is it free, as recorded by Moynihan, from the immediate danger of perforation, quite aside from that of subsquent obstruction. It seems, therefore, important, that some method, equally certain in its action, but less dangerous in its possible sequelæ than this most ingenious device should be contrived. Obviously such a device must "punch out" the juxtaposed parts as freely as the "button," because failure to do this is undoubtedly a factor in permitting the partial or complete closure of the gastric enteric fistula. The ultimate cause of this contraction is not yet known and it offers a very fertile field for investigation.

About ten years ago, Dr. Theodore A. McGraw, of Detroit, described a very simple method of making enteric anastomoses. It consists simply, to quote his own words, of "A Lembert stitch and a ligature." After choosing the parts through which the opening is to be established the operator places a row of Lembert stitches so as to join the surfaces for a distance of about one inch and a half. A stout elastic ligature, threaded on a round needle, is then passed into one viscus near the beginning of this suture line and out near its termination. Similarly, the needle transfixes the opposite organ and the ligature is then tightly tied. The Lembert row is completed and the parts replaced. The elastic cuts its way through in from two to three days. Obviously, neither this technic nor any modification of it could be employed for the relief of complete obstruction, although it is probable that a certain amount of leakage must take place some time before the elastic is liberated. Here again there is need of further observation. There exists, however, a large class of cases in which the establishment of an opening is not an *immediate* necessity, and in which delay may be of positive value.

That the ideal technic is not yet reached and that a spirit of unrest and uncertainty is rife is evidenced by the following quotation from Dr. Geo. R. Fowler: "It may be that further experience will show that the use of McGraw's elastic ligature will prove of use in respect to both the jejunal reflex and the occurrence of shock and collapse as well as the possibilities of infection, since the period of time occupied by the elastic ligature in completing the anastomosis, namely, from forty-eight to seventy-two hours, corresponds closely to that in which vomiting is mostly to be feared, and the rapidity with which the operation can be performed and the cleanliness which it makes possible guard against shock and infection. I confess, however, to a feeling respecting the elastic ligature, akin to that expressed by Codivilla, who, speaking of the use of the Murphy button in gastro-enterostomy, said: 'Its good function is always in God's hands.'"

That the ligature, when applied in accordance with McGraw's technic, gives excellent primary results, however, is hardly to be doubted. It has been practised successfully by men of the highest standing quite aside from the numerous times it has been employed by its distinguished inventor. In a recent letter Dr. McGraw says: "I have heard again from Dr. A. J. Ochsner, of Chicago. He has just operated on his sixth case, the other five having given most satisfactory results."

Are these immediate results to be permanent? Undoubtedly Dr. Weir voiced a general criticism of the method when he said that he had feared to use it because it did not "punch out." He believes that although the opening may be made practically as long as the operator desires, its patency may be effected by the growth of bands forming bridges from one side to the other. This seems a very plausible hypothesis, since, for considerable periods, the raw edges of the slit must lie in apposition, and such bridges, if formed,

would in time narrow the lumen to a useless fistula.

In April last the writer began a series of laboratory experiments which aimed at finding a method so to place the elastic ligature that it *would* "punch out." Rabbits were first used, but they died from shock or from obstruction—the gut being too small to work upon satisfactorily. Dogs, however, reacted admirably, and although, as is well known, successful work with their gut does not always imply that like results will follow the employment of like technic in the human intestine, because of the great dissimilarity of the organs, conclusions of a presumptive character can be reached by this means.

Dr. McGraw kindly furthered my efforts by sending a dozen of his ligatures which are made to his partial satisfaction by Messrs. Nelson Baker & Co., of Detroit. These gentlemen hope shortly to offer an elastic somewhat smaller than the present one and as strong. The ligature now on the market may be described as follows: It is a black circular band, almost a foot long, and so sharpened as to be easily threaded on a flat-eyed needle.

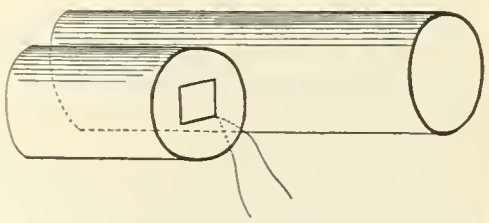
Fig. 1.

Dog's Stomach—one of the early specimens—the bands referred to are seen uplifted by rubber tubes. The lumen in the specimen was larger than is shown in the photograph, where it appears as a small slip because of the presence of the tubes. A cm. scale is appended.

It will stretch over six times its length and is virtually unbreakable with the ordinary force of the fingers.

In the preliminary experiments the elastic was so placed that some excellent results were obtained in that an irregular opening was always made. In every case, however, two bands of tissue stretched directly across the opening—as seen in Fig. 1—two bands of mucous membrane from the gut and stomach pass over two rubber tubes.

Fig. 2.



Crinoline model showing the method of applying the stitch.

The bands are at right angles to each other and partly occlude the lumen. The manner in which this tissue came to be left was never worked out and although each semicircular opening could be made, at will, larger than the pylorus, the technic was evidently defective, though not to be unreservedly condemned.

Mr. Edward Cussler and Mr. J. S. Thomas, both juniors in the medical department, assisted me throughout, and it is a pleasure to state that the further and apparently successful modification of the McGraw technic was made by them. It is a further pleasure to state that without the hearty co-operation of Mr. John T. Hoyt, of the Physiological Laboratory, this work could not have been carried on so successfully.

Fig. 2 shows a sketch of a model in crinoline of the stitch as modified by the students. The point of view is from the mucous surface of either the gut or stomach. The four sides of the rubber square which are seen, lie directly upon four corresponding sides of a similar square in the opposite and juxtaposed organ. How such a stitch can fail to "punch out" as much as may be desired is not clear, although the experiments made are by no means sufficient in number to justify more than conservative claims for it.

If, after passing such a stitch, the parts are gently separated so as to show three of the four corners of the square, it will be seen that at each point and virtually through the same hole the ligature passes twice. If the sides of the square be made 3 cm. long it will be noted that unless the intervening tissues between the angles be held in close apposition, there will be danger of leakage. In using a square form of the stitch, then, it is absolutely necessary to protect the part with a continuous or an interrupted Lembert stitch. If an octagonal form be used, the need for such protection would be more remote because this would double the number of through-and-through stitches and give intimate junction of the apposed serosa, simulating the conditions established by the use of the "Murphy button."

The following is a technical description by Mr. Thomas of the method of inserting the liga-

ture: "It is possible at will to make the opening a triangle, square, hectagon or octagon. A square provides, to all intents and purposes, a circular opening. It was used in all save a few of the later experiments. The detailed technic

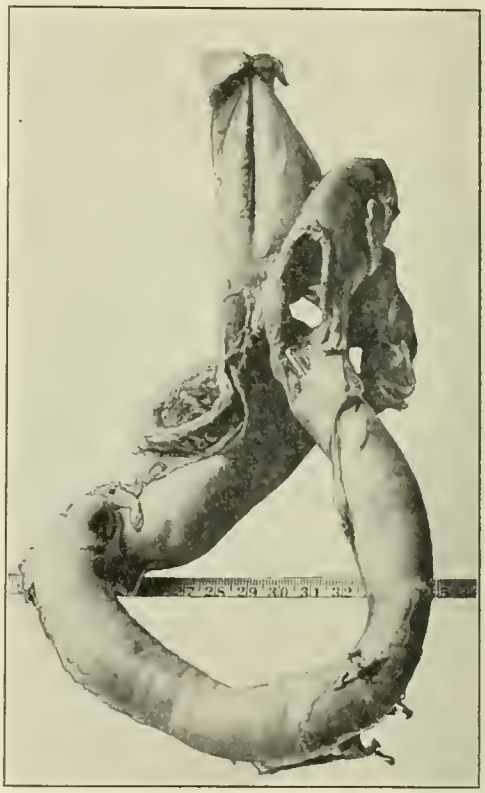
Fig. 3.

Dog's Stomach with section of jejunum attached—the latter split open to show its mucous membrane. The preparation was hardened in formalin—a cork which dropped into the fistula by its own weight having been inserted to prevent shrinkage.

of insertion is as follows: Decide on the size of the square desired, and, after approximating the surface, gut and gut or stomach and gut so that there may be no unnecessary tension, place a Lembert stitch of silk to join the two viscera at each of two points destined to be the diagonally opposite angles of the completed square. These stitches will hold the parts together and will serve as guides for the introduction of the ligature. The needle is introduced into one of the apposed viscera at a point selected for one of the remaining angles and brought out beside one of the guides. From here it is passed through the opposite organ, care being taken that the needle thoroughly pierces the mucous membrane—which is somewhat resistant in a dog but not so in a pig—and out again at a point diagonally opposite the starting place. From this point to the point of beginning the steps are directly reversed, viz.: the needle re-enters the first viscus, emerges at the first guide, re-enters the second viscus and emerges as nearly opposite the starting point as possible. The stitch is then just half done; two sides of the square are completed, and the arrangement of the elastic ligature may be correctly represented by a figure 8 bent in the middle. The remaining two sides of the square are completed in the same manner, care being taken to make the distal loops of the two figures of 8 interlock."

In the earlier work with this stitch the ends of the elastic were tied with fine silk, precisely as recommended by McGraw; but, recently, it being found how firm a knot could be tied with Senn's iodized catgut, and that it would not slip, this was substituted for the non-absorbable silk. No. 2 gut was found to hold the ligature long enough to allow it to "punch out:" then absorption of the gut freed the knot and allowed the elastic to uncoil. The result was simply that the

Fig. 4.

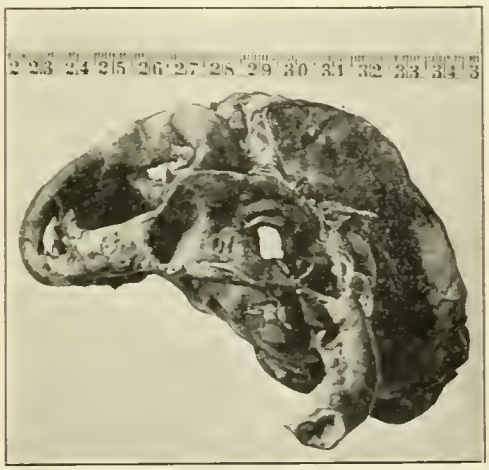


Dog's Stomach showing a small portion of mucous membrane, the pylorus and the attached duodenum. A window has been cut in the gut showing a hexagonal opening into the stomach. This specimen was filled with one-per-cent. weak formaldehyde solution, and the extremities tied. The relations of the lumen to the gut are therefore preserved in just proportion.

ligature, when passed by rectum or when vomited (one case) came out perfectly straight (see Fig. 5), looking much like a bit of old-fashioned slate pencil, 5 cm. long. There may be no merit in this, but a straight piece of elastic in the alimentary canal might be even less objectionable

than one coiled and knotted. Furthermore, it is thought that the liberation of the elastic will be a factor in preventing its adherence to the mar-

Fig. 5.



Dog's Stomach, showing duodenum and quadrangular opening. Size shown by cm. scale.

gin of the fistula as was noted in several cases operated upon by the McGraw technic as well as by our own. This retention of the ligature is a factor which merits further observation, and sug-

Fig. 6.

Dog's Stomach seen from mucous surface. Five openings are shown, three of which are the cut ends of the pylorus and the gut—the fourth being the pylorus, and the fifth, the fistula.

gests the possibility of doing away with the elastic altogether and using heavy iodized gut in its place. This, if practicable, would indeed be ideal—the utilization of an entirely absorbable material which would vanish as soon as its work was done. Further experimentation will determine this point.

The time consumed in taking the stitch varies very naturally with the experience of the operator. To make a square consumes, perhaps, twice the time necessary to place a "Murphy button" or the simple McGraw stitch—probably a little less than the ordinary method of section, excision and double ligation. It appears, therefore, that no objection can justly be made to it, since the time requisite for its performance falls within reasonable bounds. Furthermore, it is no doubt true that if we have had but little trouble in placing the stitch in the tough elastic viscera of dogs, hands more expert than ours should experience less annoyance and less delay in inserting it in the more easily handled human gut. That this may be true is shown by the ease with which the ligature was placed to form a triangu-

Fig. 7.

Dog's Stomach seen from serous surface, showing a very satisfactory opening.

lar entero-anastomosis as well as a quadrangular gastro-jejunostomy in a pig weighing 120 pounds. [The pig is fed on the refuse from the hospital and has since gained eighty pounds.]

Autopsies have been done on seventeen dogs. Three dogs, with the pig, will be kept until fall, to form, if possible, the nucleus of a further report. Of seventeen dogs in which elastic ligatures were placed in a variety of positions; straight, cruciform, triangular and square, some with and some without burying Lambert sutures, six died. One perished from intestinal obstruction due to a band situated at a distance from the site of operation, and probably caused by rough handling; two, in which no protecting stitches whatsoever were used, from perforation at the site of ligature, showing the imperative need of such support; two from pin-point perforations of the gut, due to bad technic, one from sepsis (3½ months) from a localized stitch abscess. While it is not intended that this incomplete report shall form the basis of any mortality comparisons, it is not without interest to note that there were no deaths

in those cases where the ligature was applied in conformity with accepted rules of enteric surgery, which might not have occurred in the execution of any other technique.

From this too small and confessedly incomplete series of experiments the following conclusions suggest themselves:

1. The McGraw Elastic Ligature can be so inserted as to "punch out" as large an area of the juxtaposing walls as may be desired, with at least as much certainty and with greater safety than the Murphy button.

2. That the margins of such openings are smooth and not unduly cicatrized.

3. That the elastic ligature may remain in situ after punching the openings, although this is less likely to happen if tied with iodized catgut.

4. That such retention in the mucosa of so soft a material is not apt to be harmful or permanent.

5. That the time required is not sufficiently increased to render the use of this technic impractical.

6. That perhaps enough has been suggested to stimulate further research by others, so that the actual facts in these most interesting problems may shortly be brought to light.

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**Influence of Diphtheria and Tetanus Toxin upon the Blood.**—It was found by H. Kucharzewski (Centralbl. f. Bakt., Vol. 34, No. 4) that tetanus toxin diminishes the number of red cells and the amount of hemaglobin. Large doses also diminish the density of the blood. A hyperleucocytosis is also noted but not so marked as that with diphtheria toxin. It is not to be ascribed directly to the amount of toxin injected, for there is first a period of hypoleucocytosis. The number of pseudo-eosinophiles is increased while the lymphocytes and eosinophiles are always diminished. The proportion of large mononuclears and intermediary elements does not vary from the normal. When the toxic substances were destroyed by prolonged heating, these blood-changes were not noted, which proves that they are solely due to the toxins and not to the culture medium.

## A PROPOSED APPARATUS FOR THE TREATMENT OF EMPYEMA.

BY FRANCIS M. C. USHER, M.D.,
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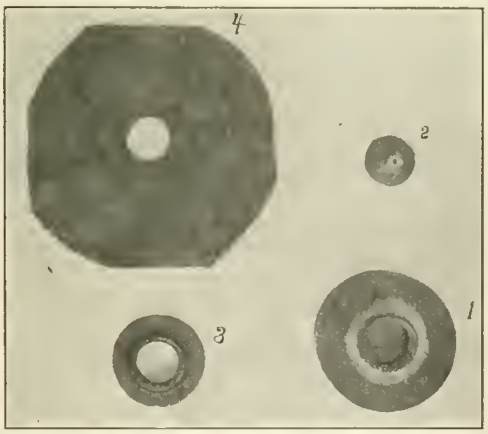
In the whole domain of surgery no branch thereof has reaped greater benefit from the introduction of antiseptic and aseptic methods than that part which relates to the surgical treatment of pleural effusions. Nor, indeed, has the application of modern methods of diagnosis secured more gratifying results; what once was in doubt can now be accurately determined by the aspirating needle, microscope and culture tube, and cases which were formerly doomed are now given reasonable hope of cure through proper surgical intervention. One of the first effective steps in this direction was the introduction of the vacuum aspirating apparatus whereby pleural effusions could be drawn off with the minimum risk of introducing air into the pleural cavity and thereby possibly contaminating and changing a simple effusion into a purulent one. In uninfected effusions this method of aspiration, repeated if necessary, will very frequently effect a cure, especially in the young. In infected effusions, however, the procedure in the end must be radically different; pus in the pleural cavity like pus anywhere else, must have free and continuous drainage before an effective cure can be hoped for. This of course necessitates an opening into the pleural cavity and establishing free communication with the outside air. The moment, however, that the visceral layer of the pleura is subject to the constant pressure of one atmosphere there arises a purely mechanical problem which has been but unsatisfactorily overcome, and which in itself is the prime cause of the unsatisfactory results following thoracotomy and the subsequent performance of the mutilative but necessary thoracoplastic operations. The lung containing elastic tissue, on the stretch at all times except in forced expiration, maintains a pull of about one-quarter pound to the square inch on the inner chest walls and diaphragm, which, being air-tight and sufficiently rigid, hold the lung in apposition to them. When an opening is made in the chest wall this negative pressure between the two layers of the pleura no longer exists and the lung is free to contract to the extent of the contractility of its elastic tissue. This it does when a thoracotomy is done for the purpose of drainage of pus. Moreover, during the course of time necessary for the cure of the abscess, the contracted lung becomes coated with plastic lymph and young connective tissue, which not only tends to contract the lung further, but, later on, when the abscess cavity has healed and the external opening has closed and the contained air in the old abscess cavity has been partially absorbed by the bodily fluids, leaving a partial vacuum, as it were, the lung being bound down by lymph and connective tissue is unable to expand and fill the rarified space. This causes displacement of the viscera and sinking in of the chest wall to obliterate the space. The deformity caused by this

may demand a thoracoplasty, which, most likely, has already been called for to coapt the chest wall to the collapsed lung, in order to cure the abscess. The rational way it would then seem to treat empyema, so that thoracoplastic operations would not be required, would be to maintain throughout the treatment the expansion of the lung and at the same time effect continuous drainage. The ac-

companying cuts show an apparatus that I have devised, which has this for its object. It consists of a metallic or glass box "1" of about 300 c.c. capacity, with top and bottom screw-threaded perforations, a perforated, nippled screw-top "2," a perforated screw body flange "3," and a section of pure bandage rubber of suitable size "4." The application of the instrument to the body is effected by fitting the hole in the center




of the rubber the screw of the body flange and then screwing the flange to the drainage box, making an airtight junction between the rubber and the instrument. The under surface of the rubber is then cleaned and roughened with emery cloth and a coat of rubber cement is applied and allowed to dry, the corresponding surface of the body over which the rubber is to be applied is also cleaned, coated with cement and allowed to dry. On application of the rubber to the body it will be found to adhere very tightly, making an airtight junction between the instrument and the body. If now the top is screwed on and connected with an exhaust pump by means of a rubber tube fitted over the perforated nipple, the air partially exhausted and the rubber tube tied, the instrument can be worn with comfort and will maintain a partial vacuum for an indefinite period. The diameter of the hole in the body flange is 1⅝ inches and the incision for the resection of the rib would best not exceed it, in order that the wound may be at all times accessible for inspection. With the resection made, the apparatus attached, the drainage tube would lead into the cavity of the box, which is filled with gauze, the top screwed on and the air exhausted, the operation would be complete. By unscrewing the top the dressings may be removed as often as necessary. The amount of suction to which a diseased lung can safely be subjected is as yet undetermined. The amount which would overcome the elasticity of a normal lung would be very small, 10 to 20 mm. Hg. The amount of rarification in the instrument could be approximated by having the nipple tube collapsible at a given atmosphere. The theoretical advantages of this method of treatment, besides those given, would be, that the expanding lung would assist in the drainage of the pus, the lung perform its normal function and the negative pressure between the pleura be re-established and maintain its aspirating effect on the venous circulation. The apparatus would of course be useless if the pleural abscess communicated with a bronchus. Its use would best be suited to early cases, and by its preventing the collapse of the lung the usual hesitancy about making an opening into the pleural cavity would be overcome. I regret that I have not had an opportunity to put this method to a practical test, and publish this description with the hope that some who may be interested, and deem it practicable, may give it a trial.

## THE ADVISABILITY OF A MORE DEFINITE COURSE OF INSTRUCTION IN PHYSICS IN THE MEDICAL CURRICULUM.*†

BY ALLEN J. SMITH, M.D.,
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I WOULD preface the matter of argument by calling attention to a mental attitude very common in medical students, the aptness to regard the mere gaining of a diploma as the summum bonum of a course of study—a habit of thought which unfortunately is capable of being carried forward into the medical practice of the physician in viewing the possession of a diploma as justification of whatever lack of skill and practical inefficiency may be exhibited in his professional life. There are of course many exceptions to the unfortunate truth of such an assertion; but in the minds of

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†Annual Address of Chairman before Section of Pathology, Texas State Medical Association, San Antonio, Texas, 1903.

those accustomed to deal with large numbers of medical students the reality, however it may be regarded, of the first part of this proposition can scarcely fail of recognition; and it needs no long search in the great body of our profession to find ample evidence of the second. In fact there lie at the bottom of these mistaken purposes and opinions so much of common human nature, so many of the temptations of an artificial strenuosity of life which has never more than now prevailed in our country, that indeed it is a matter for wonder that such faults of preparation and evasions of responsibility in action are not more numerous than they really seem.

Granted the truth of such statements it naturally follows that in the mental processes of individuals of such type there should be exhibited the equally faulty wish and effort to obtain the desired diploma and such license as it may afford at the least possible expenditure of energy, time and other valuable consideration; and in whatever feature of preparation for medical practice there appears opportunity for evasion of difficulty, of conservation of mental effort and temporal and financial convenience, in that phase of the educational course of the individual such evasions are likely to be practised. Naturally, too, in those subjects of the curriculum which do not on their face bear evidence of their immediate relation to future professional requirements are likely to be concentrated these attempts at evasion; and thus it comes to the untrained, unadvised or ill-advised student of medicine that he should regard all his studies and exercises dealing with the so-called preliminary branches of medical training as unproductive, relatively valueless and undesirable, and justly to be neglected when opportunity obtains.

Of the branches of the medical curriculum or preparatory to it which in the experience of the writer are regarded by this type of student as veritable bug-bears, *physics*, *chemistry* and *general biology* probably occupy the first rank, and probably among themselves stand in the order given. That there are reasons for the widely prevalent views of this sort among our classes is not of course to be doubted; but it is not my aim to recognize and discuss such reasons. Moreover, I do not wish to attempt to show reason for insistence by medical instructors upon thoroughness of study in all of these branches of science by our classes. Both chemistry and biology seem in a fair state to prove to even the most unthinking their absolute necessity to the really competent physician; and in fact need neither defence nor laudation. Chemistry at one time shared with anatomy in its all-pervading dignity in the medical curriculum, but rather from its relations with compounding of remedial agents than with either physiology or pathology. With the division of labor between physician and pharmaceutical chemist the older value of chemistry grew less and less in the appreciation of the first; and, eventually, had it not been for its ancient predominance and the value of occasional applications in symptomatology (especially of the urinary diseases) it would doubtless, with botany, have been entirely relegated to the pharmaceutical curriculum as non-important to the medical man. But here as in all human habits of thought there is a pendulum swing, now carrying back to its old prestige the study of chemistry, changed, it is true, in the type of its presentation and application, but each year recognized more and more in the form of physiological and pathological chemistry as one of the undeniable and main supports of our best medical knowledge. It is safe to say that within another generation physicians who are not also competent chemists will occupy just as little advanced position in the profession as do those now who are incompetent microscopists. The widespread interest in nature studies, reaching well down into the lower grades of our common schools, is sufficient assurance of the final position which general biology, at least as a preparatory branch, must bear for those who look forward to a life in medicine.

It is no great wonder that ancient and medieval physicians were not also physicists as they were chemists, when we recall the crude ideas and limitations of the general subject until comparatively modern times—the really modern establishment of such basic ideas as the true relation of the earth in the solar system, the rotundity of the earth, the law of gravitation, the control of electricity, the mechanics of steam, the conservation and transformation of energy, the vibratory theory of force and a host of cognate matters, to say nothing of the discovery of the circulation of the blood, the cellular structure of the body and the cellular theory of disease.

In the manifold applications of the principles of physics in modern everyday human life men of a score of specialized professions are employed; yet nothing of the intricacy of construction and specialization of parts, of coordination of each to the whole, often inferred rather than clearly seen, in the mechanism and function of the animal body can be realized in the entire group of the engineering professions. There is not a single branch of the medical course of study, moreover, which does not in recognizable way and degree call forth, directly or by analogy, the fixed principles of physics as clearly as in any engineering problem. The architectural ingenuity of man is barely comparable, if at all, to that shown in the adaptation of material for strength in the construction of bone, in the distribution and limitation of strain in the human skeleton; the principles of hydrostatics and of hydrodynamics with a system of compensations witnessed in the circulations of the body are applied with more intricacy and exactness than seen in the highest engineering accomplishments in connection with any of the waterways of the globe; the development and coordination of gross and minute movements of the body and its parts exhibit a desideratum for mechanical engineers to be envied but not to be attained; the production and maintenance in uniformity of the body temperature in all the varying conditions of

the body itself and its external relations in comparison with our best artificial means of heat production and regulation are as more than the work of the master to the work of the child: the complexity of the factors of physical and chemical processes operative in secretion and excretion renders the actual method almost a sealed book to the physiologist, but no man's machine is inscrutable to his fellows; the simplicity, convenience and effectiveness of the ocular and aural apparatus render our eyes and ears models to be approached but not attained by the ingenuity and skill of human inventors and mechanics; while the vast system of nervous paths and centers of the animal body may have an analogy in the most complex electric arrangements of men, the whole world of electric systems compacted in one mass can scarcely rival the delicacy, multiplicity and infinite accomplishments of the nervous apparatus of one human body.

That a branch of science having such elaborate relations with the animal body in health and in disease should find little and often no definite representation in the medical curriculum is from the first serious thought in itself marvelous. Perhaps the complexity of its bearings in medicine and the profundity of its relations to life phenomena stand as a first excuse for this most significant failure. Let this be so; it is no argument. Even Alexander's little world was not conquered in a day. No matter the magnitude of the whole, each part apprehended is a gain to human knowledge and somewhere has its practical application; part by part, every portion fixed upon the student's mind makes of him one better prepared to work out further problems for himself and for the rest of us. Nor am I unaware of the fact that these principles are here and there at the present time being given in one or other of the existing branches of medical study; but a part here and another there are by no means the same as a careful and definite résumé of the science and its scope of application to our needs; and further, those branches now working out these problems, as from time to time needed in elucidation of their own difficulties, are doing preparatory work, from which there is every reason to excuse them if we would wish them their fullest development in a speedier time. The ophthalmologist goes over a course before his class explanatory of the physics of light and lenses; the microscopist prefaces his instruction by a somewhat similar outline; the aurist discusses the vibrations of air and solids in the development and transmission of sound; the physiologist, the diffusion of gases, the laws of osmosis, questions of hydrostatics and hydrodynamics and practically every other subject pertaining to the branch in the explanation of a great number of instruments of precision and in elucidating that which is known and conjectured as to the various bodily functions; the obstetrician, the resultants of forces applied variously, successively and coordinately in directing and accomplishing the birth of the child—in short, each instructor takes up before his class some part or parts of a subject of fundamental importance to all and deserving an individual and dignified position in the scheme of instruction; and each loses just so much of his time and opportunities to press a little further toward his assigned object in the general plan.

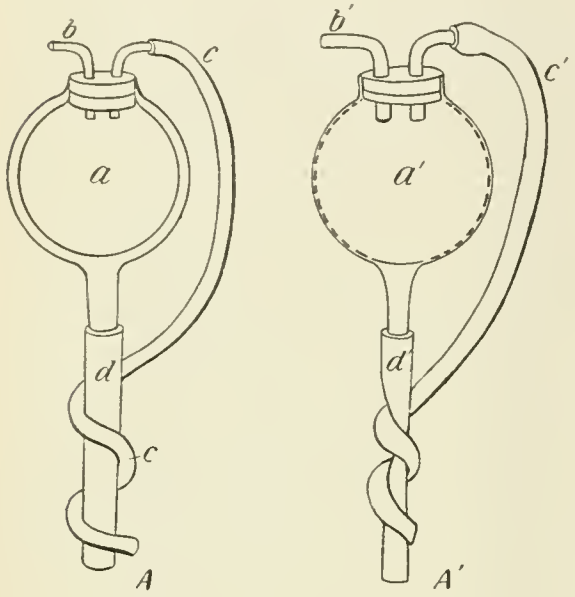
What would I make of physics in the medical curriculum? To the writer's mind the branch has a direct and particular phase of application which is spoken of as *medical physics*. For the student who has had no training in the subject when admitted to the medical school I would insist upon a course of lectures or text-book study with actual demonstration covering the general principles, and for all students laboratory exercises designed to familiarize them with the principles and actual manipulation of the various instruments used in experimental and in practical medicine, and to illustrate by experiment and attempts to mechanically reproduce outside the body by simple models such phases of nature's operations as may thus be copied. The latter part of the scheme, the distinctively medical physics, should be further elaborated according to the wish and ability of the instructor, by lecture or other mode of explanation, in indicating the multiplicity of factors and their mutual relations in the accomplishment of bodily functions, with immediate and direct reference to the influence of modification or loss of any factor toward the development of disease and its symptoms.

The matter of the construction and mode of handling of the various instruments used in experimental and practical medicine needs no explanation or illustration of its value to the student; and the release of the instructor from the necessity of discussing fundamental principles involved in his branch will doubtless be accepted as affording more chance for increased attention to and development of the particular features of his special subject. Dealing with those students who have attained the general ideas and a fair technic, the physiologist, the pathologist, and particularly the clinical physician and surgeon or obstetrician have fair field for presenting the final problems of their branches, the ultimate objects of instruction.

The student is taught that glandular secretion or excretion is dependent on the presence in the gland of more or less freely circulating blood as the source of the particular substances elaborated by the gland. He witnesses *a case of acute renal suppression* in the hospital ward and later at the autopsy meets with a deeply congested, red and swollen kidney. Will it help his appreciation of the development of the symptom if his thoughts be directed along some such line as follows? Setting aside for the time but in no way denying the importance of selective cellular activity, the mechanical forces and methods involved in urinary excretion are brought forward in greater prominence. The structure of the kidney speaks for filtration as at least one factor in renal activity, filtration of the fluid and more or less of the urinary salines from the blood. For the example in hand it is immaterial what further action the epithelium of

the convoluted tubules may accomplish. One may well compare the renal unit (the Malpighian tuft and its enveloping capsule and the tube leading therefrom) to a separator funnel lined with a permeable membrane and fitted with a compressible discharge tube. My meaning may, perhaps,

Fig. 1.




be more readily apprehended by reference to the diagram (Fig. 1, A) in which is represented an ordinary separating funnel, within which separated by an appreciable space from the inner surface of the funnel is fitted a permeable and expansile membranous sac (a) provided with an entrance tube (b) and exit tube (c) both of the same expansile type as the sac itself, and the exit tube (c) coiled about the compressible discharge tube (d) of the funnel. In a rude way this follows the type of the coiled capillary tuft within Bowman's capsule and the arrangement of its emergent capillary about the convoluted tubule of the kidney. Presuming that the pressure of the fluid within the membranous sac in the funnel (capillary tuft within Bowman's capsule in the kidney) is positive, but insufficient to stretch the sac to close adaptation to the wall of the funnel, the contained fluid will escape through every part of the membrane into the space between the sac and the funnel; and if that pressure be lowered the filtration of fluid will be diminished in rate. On the other hand (Fig. 1, A') if the pressure within the sac is increased (increase of vascular tension in the renal vessels, as in marked sudden congestion) it follows that the sac must expand to become closely applied to the wall of the funnel (the tuft to the wall of Bowman's capsule); whence it is clear that there is opposition to the escape of fluid from the sac save at the limited surface opposite the opening of the discharge tube of the funnel (the beginning of the proximal convoluted tubule of the kidney). It is to be realized that increased pressure within the sac must be carried forward along its emerging tube (c'), leading to the distention of the latter (providing the same difficulties of discharge as in the tortuous renal capillaries and veins), in this connection the particular feature of its expansion referring to its encirclement of the discharge tube of the funnel (the plexus of emerging capillaries about the convoluted tubules and the general capillary distention within the renal mass). If room for such distention is not given save at the expense of the caliber of the encircled discharge tube (as is the case in the kidney from the pressure of the general renal tissue and the resistent renal capsule) there must result narrowing or possibly closure of the discharge tube (d'), affording another mechanical factor in inhibiting whatever tendency toward filtration may continue in the funnel above; and if the pressure be sufficient through these two obstructions, one may readily infer total suppression of the filtration process. The walls of the capillaries of the Malpighian tuft are by no means entirely comparable to ordinary porous filtration membranes, but in the relation here proposed are at least analogous and in illustration of the mechanical influences named will easily bear the comparison; and silence concerning any part played by the renal epithelium in no wise impairs the illustration. Nor is it difficult to fix in the same bit of apparatus the ideas of the student as to the relation of urinary suppression and hematuria in such cases of renal stagnation from acute congestion.

Another striking example from pathology suggested by the same line of thought concerns *the explanation of the posture assumed by the patient with broken cardiac compensation* and approaching his end. It is invariable that as the heart fails the individual finds himself little by little forsaking his natural low recumbent posture at rest, seeking a higher and higher pillow, and as death approaches finding comfort only in a sitting posture with the limbs more or less elevated; and invariably change from this position to a lower or higher (more erect) attitude calls forth evidences of special cardiac effort. There are here, of course, as in most cases, a number of factors to be considered for the full explanation of the whole symptom picture; but of these that of the influence of gravity in distribution of the blood is the element of variation to which mainly must be attributed the symptoms in question. One should realize here that in the erect or sitting posture the column of blood in the aorta and its branches beyond the turn of the aortic arch must by its weight naturally produce no immaterial tendency toward keeping up the usual downward current (other factors of aid and resistence being disregarded for the time for the sake of the argument); while in the recumbent position the distribution of the blood over the whole body is practically the result of the propulsive force of the heart and vessel walls alone. The difference in cardiac labor in these two postures may be roughly stated as the

difference in lifting the column of blood from the left ventricle to the turn of the aortic arch and to the head in the first instance and the lateral propulsion of the whole arterial blood mass in the second. Or, to use a homely simile, it is comparable to throwing a ton of coals, shovelful by shovelful, over a low fence and allowing it to fall fifty feet in a vertical direction in one case, and, in the second instance, to the labor of transporting the same coals, shovelful by shovelful, across a level space for fifty feet and depositing it in a new heap. With such a view it is easily realizable that there is more labor demanded of the heart with the body adjusted in recumbent position than in either the erect or in the sitting posture, and that when the circulation is from many influences already weak and feeble, the added strain upon its walls may well call out marked evidences of its exertions. The sitting posture is assumed rather than the upright in such an instance for easily stated reasons, namely, the usual general muscular enfeeblement of the individual and (in the absence in either position of chance for free muscular and respiratory aid in venous return) the less labor of lifting the venous column of blood through the shorter vertical from the feet to the right heart when the individual is sitting than when standing. This too should explain the common tendency in such patients to keep the limbs moderately elevated when sitting, such elevation being insufficient to occasion much difference in the gravitation of the column of arterial blood but making an important difference in favor of more easy venous return from the limbs (the difference of height of the lower pelvic level and the floor).

These examples of the type of questions to be presented to the student in medical physics are crudely and but incompletely drawn; but they serve the purpose of illustration here desired and indicate the objective aim in urging the adoption of a definite course in the subject. They are both well suited to actual laboratory demonstration but not more than a host of other possible instances. In fact in the arrangement of a course it must be a matter of selection from the great number of examples possible; and the fullest scheme could not possibly deal with more than types, leaving the individual application to the intelligence and resources of the student for determination. It could not do more than attempt to inculcate a habit of thought along these lines, aroused by witnessing typical illustrations; and in the end this is one of the real purposes of every education, the establishment of a method of observation and of mental reflection and application of principles to the clinical problem of the physician. Beyond this the crowded condition of the curriculum would give but little justification for fuller work.

This matter of urging the adoption of a definite system of instruction in medical physics applies particularly to our American medical schools. For a decade or more in Great Britain it has come to be a required study for those applying for the ordinary qualifications; but in the university courses in medicine and surgery it was demanded for a much longer time. Much the same may be said of the continental universities as for those of the British. In our own country a demand for a certain amount of knowledge of elementary physics as an entrance requirement is common to all the schools holding membership in the American Medical College Association as well as to a number outside this organization. For the most part this requirement is worth nothing or very little better; in some instances the branch is but an elective in these requirements. In comparatively few college catalogues is the amount fixed at any really important grade. Inspection of catalogues shows, too, that in but a very small minority of our schools is there provided any additional work in the medical aspects of the subject; and of these few it is not at all sure in some but that the physics taught is absolutely elementary and rather introductory to chemistry, with which it is usually associated, than an applied medical physics. There are a very small number of American schools in which the catalogues indicate a really commensurate and suitable presentation of the branch, and this number by no means includes all the schools of the highest reputation in the land. Nor does there occur to the writer, in examining the prospectuses of the year or from personal knowledge or information obtainable, that there is any real tendency to remedy what after serious thought he has come to look upon as an unjustifiable negligence.

I confess to a twofold object in this sketchy presentation of what I fear is not a popular subject. The first is of course that of attracting the interest of the members of the association to the importance of medical physics in itself and to its rather common disregard in most of the American schools of our profession; but I have more directly in mind the intimate relations of this Association to the State and its medical school. In the Medical Department of the University of Texas no preliminary knowledge of physics is asked of the student about to matriculate. From early in its history the professor of chemistry, Dr. S. M. Morris, has devoted in the first half of the freshman year two hours weekly to a lecture and demonstrative course in the subject with special reference to its bearings in medical study, but has been unable, principally from lack of space and appropriate equipment to develop the actual and needed laboratory course above suggested. It is unlikely that it will be possible for years to come to demand such a degree of preliminary knowledge of the subject that it might be dropped from the course, were this desirable; since entrance demands from professional schools must in distinct degree depend on as well as lead popular education. It is toward the establishment of a fuller, more practical and more directly medical course in physics in our home school that, in closing, I wish to leave your thoughts, in which wish I know the ideas of my colleagues in the faculty of the school and my own are in accord;

and for which I am in position to know that the Regents of the University, advocates of progress wherever and whenever possible, are powerless, as in many other features of the school where advances and expansions are desirable, solely because of financial disability. I would not ask of you any concerted action in any of these matters, since such action is apt to be transient in its influence and of less value than individual effort; but I would ask of those of you to whom this paper may have appealed as reasonable to use your personal powers and influences to create in our State a popular interest in and willingness for the school to advance not only in the limited lines indicated in this paper but in all lines leading to the highest attainable efficiency.

## MENTAL THERAPEUTICS IN MEDICINE.*

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Those unsatisfactory cases referred to the domain of neurology and psychiatry by the physician and surgeon constitute a very formidable array of facts we meet and should solve. Admitting our inability to benefit these cases is against the spirit of progress in the medical profession. Our failures are, I believe, more chargeable to the profession than to the patients. This statement is no injustice to our profession, that has studied the body as a physical organism, in the battle against chemical and parasitic disease. Indeed, so interesting, instructive and progressive have these material investigations proved that many simple physiologic facts, clearly within the realm of the mental, are quite forgotten in our therapeutics.

The revelations of bacteriology and microscopy have so engrossed our attention that the action of mind on body and body on mind is almost a lost factor in our art. The interrelation between the physical and mental organism of the individual within physiological limits is common knowledge; when pathological relations exist, medical knowledge is sought.

The everyday effects of the mind on the body in the processes of digestion and assimilation, secretion and excretion, are so obvious they are overlooked in our search for rare and striking effects of mind on body. Since the common effects constitute a decided majority, it will lend us greater assistance if we reckon more closely with them, than with the uncommon, in practising the healing art. We see the physical organism out of balance and proceed to treat our patients as machines to be repaired by physical and chemical remedies alone. I believe it is a fact that the success attending any physician's practice is due in greater measure to the mental impress he stamps upon his patients than to the drugs he gives. Or stating it differently, the confidence he elicits by the patient's faith in his ability to effect a cure will go farther toward relieving the ailment than would the physical and chemical treatment without confidence in the doctor. Witness the testimonials of patients who frankly tell you your medicines always benefit them, when the same drugs given by another doctor are not only futile but often aggravate the ailment. Calling this imagination with the injunction that the patient take an introspective view of self and adjust his mental organism is admitting the mental factor while shifting our responsibility for treatment to him.

The framework called the body organized with bone, muscle, and nerve cells is but a mass of degenerating tissue when out of touch with mind, the constituents of which are perception, intellect, will and emotion. We know the mental factor is dynamic in producing disease. We know, too, the same force operates favorably in producing health. The blue pill and Epsom salts are noble, obvious, palpable, physical and chemical remedies. Force and boldness are intangible remedies applicable and operative in the mental realm. Why do medical men leave the exercise of force and boldness in therapeutics to the charlatan? Intelligent mental force and boldness in exploring unseen regions in the body has enabled surgery to perform many cures where exact conditions were wholly unknown before the remedy was applied. Do practitioners of rational medicine know less of physiology and pathology in the domain of the mental than the long-haired quack? Surely courage, dignity and the indelible impressiveness of a strong personality are nowhere more pronounced than in our profession. Why then is mental therapeutics shunned by a large proportion of our profession? Many reasons may be assigned, but two are especially obvious: (1) The period of intelligent practice of medicine is but an infant compared to the many years that witchcraft and superstition dominated the healing art. The progressive thinkers were a helpless minority until recent years. Gradually intelligent thought directing physical and chemical remedies in action on material structures produced effects which appealed to perception as beneficial to the individual. (2) Exploration in the materialistic realm presenting as it does so many tangible facts, has detracted from inquiry into the intangible domain of mind. We are, however, daily observing facts which show conclusively that the mind is a dynamic reality. Neglect of the mental did not lessen its activities, which for want of intelligent direction became the field of operation for the masses of illiterate who could perceive effects, without reasoning to their cause. It is only in recent years that psychology has been intelligently studied in its application to unnatural bodily states. Gradually we are learning to direct these mental forces to helpful influences on the body. The effects produced have been received with incredulity, yes, even ridiculed more rigorously than Jenner's vaccination, which our homeopathic friends use without perceiving its modus operandi.

The believers in rational, mental therapeutics

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are increasing so rapidly that only the minority are pessimists concerning its utility in practising the healing art. Not many years since when brain surgery was proposed the majority passed adverse judgment on present possibilities. It is not because our profession is wanting in men capable of utilizing mental therapeutics, but because our schools have failed to properly instruct students concerning physiology and pathology in the psychic realm. The physician who now enters practice in any department of medicine without a working knowledge of psychology is heavily handicapped. Specialists who study the whole man, though directly practising but one department, are the men who see and utilize the force of mind in medicine.

If wresting the physical and chemical treatment of disease from the realm of superstition to its present plane of rational medicine has been difficult, the rescue of mental therapeutics from Mesmerism, hypnotism, Dowieism, Christian science, plus the multitude of "pathies," each of which is but an excrescence on rational medicine, is harder. It is more difficult because it presents something active that cannot be weighed nor measured. According to Ladd the assumption that the mind is a real being, which can be acted upon by the brain, and which can act on the body through the brain, is the only one compatible with all the facts of experience. This makes the body and mind each governed by laws in its own realm, yet inseparable and interacting during life. Cases illustrating this truth are so familiar to all I cite only one:

Miss A., aged thirty-eight years, was admitted to the Methodist Hospital, Omaha, November, 1901, where I called to see her. For twenty years her mode of locomotion had been either in a wheel-chair or carriage. From birth to her eighteenth year her health had been excellent. In her eighteenth year she had an attack of fever, the true character of which we were unable to learn. She said her physician called it malaria. This fever lasted three or four weeks. When convalescent she attempted to walk, only to discover her lower extremities too weak to support her weight. No history of any sensory disorder. No deformities. Present condition: Muscles of lower extremities flaccid and but slightly wasted. Reflexes and sphincters normal. Tongue coated. Intestinal fermentation, with persistent constipation. Repeated examinations convinced me she was an invalid from long introspection. Too early attempted use of her legs was succeeded by a prolonged non-use beyond the period when they would have sustained her weight with moderate exercise. If she would walk again she must relearn the process. This she did in a few days. In four weeks she walked a mile each day, and in three months had the use of her entire body. The material therapeutics I used was Sod. Phos. daily for several weeks. The mental therapeutics I employed consisted in supplying her with conditions suggesting the use of her legs, removing all evidence of physical help by others, giving positive assurance that her spine was not diseased, and that we all knew she could walk a specified distance. This mental medicine stimulated her to effort, and the task was soon accomplished. Her courage was now in the ascendency and restraint from too arduous exercise, was necessary. Without consulting her judgment of what she could or could not do, I mapped out as on a checker board a graded scale of exercises for her daily use. I specifically indicated her diet and the hours when she should eat, sleep and exercise. She told me everybody, doctors included, said her spine was diseased, that she could not walk, and she, believing this, suited her actions to the dictations of her mind. I never interrogated a more "unwilling witness." She had been thoroughly drilled in answering questions intended to establish it as a fact, that her spine was diseased. On cross-examination her ability in evading self-contradiction was remarkable. This extreme case illustrates what we all see in lesser degree in our daily practice. Experience teaches that the laws governing the bodily functions originate in the realm of the mental. With this fact existing, we may only rise to the possibilities of our profession when we cultivate an acquaintance in the domain of mind, commensurate with our understanding of the physical body.

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## USES AND LIMITS OF NON-PHYSICAL THERAPY.

BY SMITH BAKER, M.D.,
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No discussion of the uses and limits of non-physical therapy can reach tenable conclusions without first defining what is meant by the term.

When this attempt is made one becomes conscious that the data for such a definition are largely wanting. The conception, non-physical therapy, is yet a mist of vague generalizations from which it is difficult, if not impossible, to draw forth an image clear or very promising.

From what one can learn, non-physical therapy seems to include not only the use of subjective forces, whatever these may be, but also of the various media through which these supposed forces are manifested. Thus the "mental healer" not only thinks what he desires to accomplish, but seeks by certain physical means, both ordinary and extraordinary, to convey his thought to the comprehension of his client. Even where so-called "telepathy" is assumed, it is supposed that some subtle bridge or other serves to convey the molecular agitation of the influencing brain to the ready-to-be influenced brain of the recipient. At least this is what I glean, not so much from what is published as from methods really used in special instances. And so with the "prayer-curist," the "faith-healer," the "scientist," and the like. The practitioner himself not only prays either silently or audibly, or does something objectively patent, but also requires an actively responsive subsidence of all opposition and doubt on the part of his subject, just as there must be more or less

acquiescence when hypnotism is exercised. In either case there is more or less use of physical means through voice, vision, touch and the like; which means are quite as obviously necessary as is the subjective power behind them. Even Dr. Riviere, in his very recent paper before the International Medical Congress, makes his conception of psychotherapy to include the uses of heat, light, and electricity; while a recent caller has astonished me by affirming that the newly discovered gaseous elements, argon and helium, are the medium through which all such influences are transmitted. We see, therefore, that in a definition of non-physical therapy which shall strictly conform to facts only, we must admit at least a modicum of physical elements, in addition to whatever non-physical ones we may choose to include.

But this is not what the authoritative votaries of non-physical therapy claim. They usually affirm that the influence is purely immaterial; is, in fact, an influence of "pure mind," or "pure soul," upon some other one. Sometimes this is said to be embodied, but in some supraphysical way, as, for instance, in the cures of so-called "spiritualists"; yet, in the end, "pure mind" or "pure being" is held to be the real fountain and stream of all the non-physical therapy, which, to them, is worth considering.

This attempt to define non-physical therapy brings us at once to an important conclusion, namely, that, before its uses can be determined, there must be more accurate investigation of all these matters, and more credible records of both subject-matter and results, than are now to be found, and this, in spite of the labors of those who have already attempted to place them in a truly scientific order. Probably there is nothing in all the broad realm of functional neuro-psychoses that is so universally evident at the present time, as the part played, either for good or ill, by non-physical therapy. Almost every case, at some time or other, goes through some phase of it, and quite as often as otherwise to no good whatever. On the other hand, there really are instances of neurasthenia, and hysteria, and chronic invalidism, aboulia and dependence, which are markedly helped, and this more or less permanently, and too, after various futile exhibitions of material appliances and remedies. That there is something which our gross and even our fine pathologies, and all our medicinal and medical remedies do not yet explain and reach, is gradually being defined, by many, yet crude, practitioners in these various fields. What that something is, and how to find out about it and legitimately to make use of it, remains yet to be seen.

This will not, cannot be, however, until several difficulties are themselves better defined:

1. There must be a clearer notion of the difference between initiative and cure. To start a person on the road to recovery may by no means assure his traveling it successfully to the end. Yet this is just what the non-physical curist assumes more frequently than otherwise. Thus the wife of a physician of my acquaintance could not sleep. No kind of legitimate medication seemed to have the desired effect. The doctor heard of an institution where such things were cured by so-called "therapeutic suggestion," and sent his wife there. She was promptly assured that she could be cured, and very soon she was cured, that is, apparently. Encouraged by this, the doctor himself went to the institution for instruction in the art, which he seems to have pursued thoroughly. Since which time, however, he is obliged to treat his wife rather regularly in order to keep up the sleep habit, first suggestively induced. As an initiative, the suggestive treatment was a success. As a cure, not so, any more than the ordinary hypnotics would have been. Cure, in any given case, may stand for very different results; as, for instance, simply to restore to the former degree of health; or, only to a partial degree of health; or, only to an abiding hope that eventually health will be attained; or, to the stage of a mere temporary relief. In either case, both the popular and the professional idea of cure seems to be but vaguely differentiated; yet this constitutes a real limit to the uses of non-physical therapy, which seems to be rather deeply fixed. Cure, in any comprehensive sense, should include both the beginning and the end of the disease cared for.

2. Another difficulty, a profound and far-reaching one, which must be taken critically in hand before the uses of non-physical therapy can be determined, is the professional apathy, fear, and taboo with which the whole subject is so commonly regarded. We naturally shrink from the uncanny, to say nothing of the ignorant conceit and assertive presumption which so generally deal with it. "There is nothing in it," easily satisfies, and allows us to think that if we stick to physical methods closely enough, we have done our whole duty. There is also the allied fear that we shall simply make ourselves ridiculous, and, in the end, accomplish little or nothing worthy of our pains. Altogether, it is truly enough a subject for taboo, either tacit or actual; but, as such, is involved in a difficulty which must be overcome before headway in investigation can be made or definite indications or uses be determined.

3. Other difficulties are the essential ones which possibly may never be overcome. Especially is the impossibility of analyzing such concepts as "mind," "spirit," "faith" and the like forbiddingly important; so much so that one hesitates to attempt anything bordering upon the subject. Yet we have only to think that it is precisely the same case with heat, light, electricity, chemism and the like to see how interferingly fallacious such a feeling is. Here no one thinks of trying to resolve the concept into simpler terms. Heat is heat, light, light, and so on. And so on, too, mind is mind and nothing more in the last analysis is possible. Yet, as in the case of so-called physical agents there has been no end and there seems to be no end possible to the extent to which investigation and knowledge of their manifestations may be carried, so let us hold that

even though we cannot define mind, soul, etc., we can proceed to study their manifestations with a thoroughness which has never yet been given, and with at least some prospect of encouraging success. So long, however, as we wilt and refrain under the spell of philosophical nescience we will most certainly make no headway.

4. This leads to the important question, Is there actual need of special training for this kind of investigation? Much can be said, undoubtedly, concerning the worth of the work of all who have heretofore carefully worked along these and similar lines; but one cannot refrain from believing that their results would eventually have been much more convincing, had the investigators and reporters, to a greater number, been practising neurologists and psychiatrists, especially such as may have been rightly facultied, and qualified in special ways for such an undertaking. The trouble, thus far, has been that in too many instances the materialist has seen only material sequences in the human world: while the immaterialist or, technically, the idealist has seen similarly that everything is derived from and hinges upon immaterial foundations only. What is needed, is an all-round observer with keen eyes for mind matters and for body matters and for related affairs, all in one vision. At any rate it is increasingly evident that until the matter of non-physical therapy is taken in hand by those especially qualified to be capable of this vision, it will be practically impossible definitely to determine what the field and limits of non-physical therapy may really be.

But given accurate data and definite conclusions, it remains to ask, Is non-physical therapy properly a remedial desideratum? To which the answer may be given variously, according to predilection and experience.

Nothing that mankind becomes vitally interested in should be regarded as too trivial for investigation or use. The fact is, many of the so-called diseases themselves are, from certain points of view, rather more frivolous than otherwise, yet no one would deny their being legitimately the subjects of labored observation and much reflection. If this matter of non-physical therapy seems trifling or frivolous, we must remember that both to the sufferer and his healer it often seems to be of an importance much too serious for ridicule or neglect. The rather, both the practitioner and his subject have equal need that there shall be skilled elucidation of that which at present is so speculative, if not fraudulent. Either there is something in these matters worth while or there is not. Practically we cannot escape certain problems which definite instances present in every clinic. Thus, a cultured woman, aged thirty-five years, married, residing in one of the larger cities, having an acquired neurasthenia of long progress and standing, had been under the care of a leading practitioner who gave her electricity, tonics, baths, rest, massage, etc., assiduously, but yet without much benefit. She now declares that, in some way or other, she absolutely must have relief from her alternating mental and nervous irritability and weakness and apathy. She adds that an acquaintance, who seemingly was like her, has meanwhile been under the care of some sort of faith healer and has been cured. Cannot she, too, be benefited? If not regularly, then in some such manner, and so forth.

Now, such typical problems demand solution repeatedly, both in our own practice and in those of our confrères. Tired and disgusted with the ordinary physico-remedial measures, such people logically ask, if some sort of non-physical therapy is not in order. To which, who of us is now prepared authoritatively to say. Yet, says Dr. S. Weir Mitchell: "If he does not intellectually respect the complex matters of soul, mind and body and their interdependence, he is unfit for the higher seats in the temple of the god of medicine."

It seems to me, then, that inasmuch as medicine not only discusses the body and its functions and diseases, but also the mind and its peculiar aberrations and alienations, there is no impropriety whatever in admitting the legitimacy of the field of non-physical therapy, as one for research and possibly for practice. As a matter of fact, the study of non-physical phenomena, whether remedial or otherwise, is but a study of reflexes, and as truly this as is that of the knee-jerk, or the ankle-clonus, or the Argyle-Robertson sign. Only they are reflexes of a so-called higher and certainly much more complex and diffusive order, than these latter are. Possibly, it were worth while just now to put these on a par exactly with the simpler sensorimotor phenomena, and always to require their elucidation whenever the nature of the case demands. Practically, every case of disease has its more or less pronounced associated psychosis which often varies both the natural history of the physical ailment and the effect of the remedies prescribed. Moreover, it is a common belief that suggestion plays an important part in determining the ultimate uses of ordinary remedies. It would not be a very unwise step at least to attempt as never before to place all this on a par with other branches of medical science and practice.

Nor need we hesitate to do this because *a priori*, and even most probably *a posteriori* a generous use of the imagination will have to be made in the prosecution of the enquiry, as well as in the statement of final conclusions. The fact is, there has been and there must be all along, this very imaginary or subjective element in all our histology and pathology, even as there is in all the basal conceptions of the purest physics everywhere. When we think of it, such fundamental notions as the "nebular hypothesis," "evolution," "atomic theory," "neuro-psychical parallelism" and the like are simply figments of imagination, the pictures which the mind discloses as it attempts to comprehend the constitution and function of the universe. But this is considered to be perfectly legitimate: and especially so, since

the masterly essay of John Tyndall on "The Scientific Uses of the Imagination" was published. And so in all our conceptions of histology and pathology, materialize them as we will, there is yet included representative as well as presentative elements, and this to no impairment of their worth whatever; for we all know that they each and all stand, at best, as working hypotheses, to be modified, as future discoveries and thinking shall determine. So must it be in any and every attempt to study and relate the field of neuro-psychical therapy. Imagination will have to be used, and this generously. The only question is, Who shall be considered able to do it so that credence can be given to its conclusions?

In conclusion, then, we must note, that the irregular practitioner, either honest or dishonest, is gradually defining a field of non-physical therapy which sadly needs investigating with all the skill of the highest grade of endowment and training: also, that this cannot be done, except those who have the requisite preparation devote themselves to it persistently until the facts are ascertained. The ideal investigator in this field would seem to be one who, with a most thorough academic and professional education to begin with, shall then take post-graduate courses, not only in every practical field, but having likewise disclosed an aptitude and liking for psychological and psychiatral research, shall take special courses in these fields also. To such a one the way to satisfactory achievement is wide open, and certainly not crowded.

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## THE SIGNIFICANCE OF ALBUMIN AND CASTS IN SURGICAL PATIENTS.*

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The statement of a surgeon of considerable experience that he would not operate in the presence of albumin and casts, except in cases of great necessity, excited the writer's curiosity to investigate the prevalence of these indications of renal disturbance in recent surgical patients at the Boston City Hospital.

The report must be considered as barely more than preliminary in character. To carry out such an investigation to its full completion would mean years of observation of individual patients in large numbers, a task almost impossible when dealing with charity patients. If the statements of life insurance examiners be true that temporary albumin in the urine does increase the risk, even though to a slight degree, it must in the same way influence the later histories of our surgical patients. That it influences the immediate history, however, of patients suffering from surgical diseases is extremely doubtful.

Without doubt there is danger in operating upon a patient whose kidneys are incapable of sufficient elimination and where there are secondary organic changes. But because a patient exhibits a small amount of albumin, hyaline and fine granular casts, with renal cells, the conclusion should not be hastily made that he is not a fit subject for operation. Definite contra-indications in the way of deficient elimination, vascular degeneration or other organic changes must be present.

On the other hand, to avoid the mistake of being too casual, the presence of any renal danger signals should make one take heed lest he overlook concealed or unsuspected serious lesions.

Five hundred cases showing albumin and casts in the urine admitted within the last two or three years into the surgical wards have been roughly analyzed. Altogether 4,185 cases were considered. Of these, none that showed obvious renal degeneration or glycosuria has been included; nor have patients suffering from genito-urinary disease, burns, erysipelas or similar diseases been included. We found, first of all, that approximately a good 35 per cent. of all patients treated in the surgical wards showed signs of renal trouble. This is probably a fairly accurate proportion of surgical patients in whom we must expect to find albumin, casts, etc. Indeed, we believe this percentage is below rather than above what we should look for, because it is not rare to find a record made by the house officer of "negative urine" where an attached urine chart shows that albumin and casts have been found. In other words, the significance of small traces of albumin with or without casts may be of so little value in the average patient that the house officer dismisses the findings as of no importance, especially where the progress of the case has been uneventful.

Practically every form of injury and disease is included in the present 500 cases, the majority being of serious nature. At least 60 per cent. underwent operation. About 12 per cent. suffered from fracture. In this connection it is of interest to note that these patients, with few exceptions, were etherized, many for operations of length, yet there is nothing to indicate that any renal damage was inflicted by the anesthetic.

The urine examined was that which was passed soon after entrance to the ward. The accuracy of the examination varies more or less with the ever-changing house officer. Undoubtedly rare casts and cells were frequently overlooked in the pressure of work. The quantity of albumin varied from the slightest possible trace to one-eighth per cent. In 16 cases one-fourth per cent. was recorded; in some of these the quantity diminished later to a trace or disappeared entirely. In others, amyloid disease was probably present. Occasionally no albumin was found, although casts were recorded.

In about half of the 500 cases casts are definitely recorded, probably less than the actual proportion. Blood and pus occurred very often, especially in the urine of women. Fatty casts and blood casts were not infrequently noted, but apparently they bore no special significance. The

* Read at Meeting of American Surgical Association, Washington, May, 1903.

twenty-four hour quantity of urine was not included in the reports of any of these cases. Patients as a rule that required special attention in this regard were eliminated from the present inquiry, as there were suspicious or marked renal or genito-urinary lesions.

In brief, we were curious to determine how much apprehension we should feel when about to operate upon patients without obvious renal degeneration, passing plenty of urine of good specific gravity, in which a trace of albumin with casts is unexpectedly found.

To take up in detail certain points we found that about 10 per cent. of the cases occurred in children under fifteen years of age. This was a much larger proportion than was expected, and as only eight per cent. of all patients treated at the hospital are children under thirteen years of age it makes the proportion astonishingly large. Furthermore, we find that 44 per cent. of the cases were between the ages of sixteen and thirty-five years; the time of life when albumin, at least in non-surgical patients, is supposed to be comparatively rare. Between thirty-five and sixty years of age we find 36 per cent. of the patients and about 10 per cent. were over sixty. What the relative proportion of the various decades bears to the ages of the 4,185 patients was not determined, but in whatever way it is considered, the relative and actual number of children is higher than anticipated.

The cause of the albumin and casts is difficult to determine. Nearly a quarter of the patients over fifteen years of age entered the hospital for some form of traumatism, and presumably the renal trouble was present at the time of injury. It is fair to infer that the children were active and well at the time of the injury that brought them to the hospital. Possibly alcohol is a factor in the renal irritation, because it would seem to be almost the exception for an adult patient, male or female, not to use alcohol to some extent. Many are steady drinkers; some drink to excess. Whether this alone or the combination of alcohol, insufficient or improper food and hard work is enough to cause the requisite irritation it is difficult to say. It is certainly suggestive. Sepsis, unhygienic surroundings and improper clothing are probably factors in causing albuminuria in children. In a few cases, too few to be more than suggestive, the albumin and casts that were present in the first specimens of urine passed disappeared in subsequent specimens; sometimes after operation, sometimes in cases not operated upon. A number were found in septic cases (appendicitis, etc.), where the renal disturbance seemed due to the sepsis, subsiding as soon as drainage was established by operation. The effect of simple food, rest and warmth must be considered as well. It is quite possible in non-septic cases anxiously awaiting operation, that a temporary albuminuria may be caused by the mental disturbance in a way similar to that in which cardiac murmurs are not infrequently caused.

Of the 500 cases tabulated, 63 died. These will be considered later. In the remaining 437 patients, the natural query is whether convalescence was influenced in any way by the presence of albumin and casts. So far as could be told from a general review, without carefully analyzing each case in detail, convalescence seemed to be such as one would expect under the general circumstances; in other words, normal recoveries were as satisfactory as could be desired. Where there were complications or set backs, there was adequate explanation on grounds independent of any renal lesions.

In the 63 fatal cases, casts were absent or not seen in 30 per cent. Eight patients died from shock. Of these, one patient, seventy-two years of age, with advanced carcinoma of the breast, died almost immediately after a long operation. It is barely possible that a slight renal lesion had some influence on the result. Two died after operation for general peritonitis, one each from multiple injuries, operation for appendicitis with profound sepsis, typhoid perforation, hemorrhage following common duct operation, and septic pelvic abscesses; all potent causes of death without the slight effect from kidneys doubtfully damaged. There were 5 deaths from pneumonia, 3 from tuberculosis, 19 from general sepsis or severe peritonitis, where there could be no doubt as to the infection alone being a legitimate cause of death. In addition there were deaths from embolism, malignant disease, cardiac disease, skull fractures and pancreatitis, where the rôle of the urinary organs must have been insignificant. Of four cases in which death was ascribed to senility, one with cellulitis of the arm had one-quarter per cent. of albumin and casts, one with intestinal cancer had profuse diarrhea, one had a strangulated hernia, and the fourth died one month after a fracture of the femur, showing only the slightest possible trace of albumin, with hyaline and granular casts.

To glance at the record of the examination of the kidneys in 12 cases that came to autopsy, not included in the group just discussed, we find that one case of portal pylephlebitis showed fatty degeneration of the kidney, another similar case had normal kidneys, as did a patient dying of gastric carcinoma, sarcomatosis, rupture of the liver and compound fracture of the leg. Fatty degeneration was found in cases of general peritonitis and sepsis, and in a fractured pelvis with pulmonary embolism. A left pyonephrosis was found in a case of abscess of the liver. A chronic passive congestion in a case of osteomyelitis with pericarditis, and an amyloid kidney was found in a case of general peritonitis. With a possible exception of the patient dying after breast amputation and the old man dying with cellulitis of the arm it requires a long stretch of the imagination to give any weight to the urinary conditions in the fatal result of these 63 cases.

In conclusion we should expect evidence of renal irritation in over a third of the surgical patients found in a municipal hospital. The mere presence of a trace of albumin, with or without

hyaline and granular casts, unattended by other evidence of renal damage, should not influence the prognosis in surgical disease or operation. The presence, however, of albumin and casts should place us on the watch for other and more significant signs of organic degeneration which may prove serious obstacles to operation or satisfactory convalescence. Furthermore, albumin and casts alone are apparently no contra-indication to the administration of ether. The age at which we must expect albumin and casts in surgical patients is under thirty-five years in over half the cases. The proportion in young and otherwise healthy children is probably as great as in adults.

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## LATER IMPRESSIONS OF THE "NON-HEREDITY OF ACQUIRED CHARACTERS."

BY LEWIS S. BLACKWELL, M.D.,
OF PERTH AMBOY, N. J.

In his review of an article on "Impressions of the Non-Heredity of Acquired Characters," that appeared in the Medical News of December 20, 1902, the author, Mr. Lawrence Irwell, a member of the Bar of Buffalo in a recent communication, apparently sweeps the field like a great cyclone by his legal acumen and scholarly attainment.

The valor of the medical profession seemingly demands a restitution of the proud structures that have been erected along the corridors of the centuries.

Having recovered from the shock, a disciple of Æsculapius essays the task of clearing away the débris occasioned by this forensic fulminator. His sophistry and the character of the arguments he advances furnish a suitable site on which to rebuild.

With the audacity with which Mr. Irwell attacks the medical authorities the writer cites in support of his position, one naturally would have supposed he would have introduced to the profession of medicine educators more renowned in therapeutic literature and less vacillating than the claimants of the doctrine of evolution. With the confidence he reposes in his coterie of evolutionists, his opposition to the statement of Darwin presented in my first article, that "alcoholism is transmitted through three generations, and the families of drunkards die out at the fourth generation, after having gradually sunk in the scale of degeneration, both physical and intellectual," is not apparent in view of his faith in the preeminence of reason over authority. My opponent claims that "no man can truthfully say that Charles Darwin has anywhere written that *acquired* alcoholism is hereditary." That was not the quotation from Darwin, but that alcoholism was transmissible through three generations unlimited by the contingency of an acquired habit. By perverting the statement of this evolutionist, supported by revelation in the declaration of the Almighty himself, "visiting the sins of the parents upon the children unto the third and fourth generation," and in my former article was claimed to be an expression of hereditary law, Mr. Irwell reminds me of the fabled animal of ancient lore, that donned the skin of a lion.

The assertion made by the reviewer "that the introduction of the Almighty and Abraham does not seem to me to aid scientific investigation," conveys the impression of their inferiority in comparison with his trusted friends—the Evolutionists. Yet when Romanes came down toward the end of life, like the Prodigal, he returned to his Father's house, and embodied in his writings the preeminence of God above every name. He evidently fails to see the harmony of science with revelation, and "is given up to his idols," reminding one of the reply made to another boy, who had said: "His father was a member of church," replied: "My father was, too, but he wasn't doing much in that line."

I am heartily in sympathy and appreciation with my rival in "refusing to follow my lead in the realms of theology." In the expression of this sentiment, he conveys as much wisdom as is anywhere embodied in his review. I am not a leader, and possess no capacity for leadership in theology, law or medicine. I am simply a humble disciple of Æsculapius, sitting at the feet of the great teachers, who have adorned the profession, seeking to gather at least some instruction by which I might aid my coadjutors in lessening the ills of human existence.

In my previous article I presented the following extract from the quotation taken by Mr. Irwell from Dr. Adami's paper: "That alone is inherited which is the property of the individual at the moment he becomes an individual, which is a property of the germ plasma, from which he originates." In my comments on this statement, I said: "This is certainly a truism, and accepted as a fact, it seems perfectly plausible to assume that any element by which it was infected would be transmitted to the fetus, and in the case of syphilis on the part of either or both parents would manifest its presence as it had been revealed in the autopsy of a seven months' fetus." This syphilitic element certainly becomes a property of the germ plasma, which Dr. Adami justly claims as the property of the individual.

In the colossal Encyclopedic Medical Dictionary of Dr. Frank P. Foster, editor of the *New York Medical Journal*, hereditary syphilis is defined as "a syphilis transmitted at the time of conception, either through infected semen of the father or an infected ovum of the mother, or through both." This lucid signification of this form of the loathsome malady does not convey the idea of being an acquired disease, except through heredity, and conflicts with the statement of Dr. Adami that "there is no such thing as hereditary syphilis."

Mr. Irwell apparently gathers an immense amount of comfort from this sentence in Dr. Adami's article: "Any disturbance due to influence affecting the individual from without while in utero is acquired." That is a self-evident

proposition, since no individual exists until after the union of the two elements involved. The doctor would undoubtedly classify maternal impressions as an illustration of this disturbing influence.

A diathesis may be developed by habits of life, unhygienic conditions or environment, yet it also represents a congenital condition originating as the result of inheritance.

While the claim of Mr. Irwell, that the convictions entertained and expressed by some writers may be due to a failure in differentiating between the results of heredity and a habit acquired by association or imitation, may be true, yet it is a question whether this propensity toward the establishment of the drink habit may not be largely the outcome of inheritance. The assumption made by my opponent in seeking to lessen the importance of heredity by reference to the fact that "lectures devoted exclusively to heredity are not usually given in American medical colleges," and "that treatises on heredity for physicians are not numerous" is a truism, yet it does not detract from the importance and value of the subject. This assertion also applies to the topic of etiology of which heredity forms only a part.

The statement made in Dr. Adami's paper, "To judge from the medical press, we medical men care for none of these things," is confronted by Davis (*Chicago Journal of Nervous and Mental Diseases*) Magnus Huss, Thompson de Kapein (*Arch. de psychiatre*), Faguet (Heredity in Alcoholism), Louis (Essay on Hereditary Diseases), and many other authorities. These representative men of science with those already cited in my previous article are certainly sufficient to indicate the claim that physicians are not only willing but have made the study of heredity a subject of great interest and profound investigation.

In the concluding paragraph of his article Mr. Irwell says: "I have never asserted that acquired characters cannot be transmitted." This would be superfluous, as the idea by transposition is embodied in his subject—acquired characters are not hereditary.

"Although I attach little importance to authority as compared with reason," writes Mr. Irwell, who in utilizing a vast amount of this material in his discussion, evidently "shows his faith by his works." "I feel justified in resorting to a little evidence of this kind." He says: "The leading neo-Lamarkians claim that the blind fish found in caves are progeny of fish that became blind by accident."

As exercise promotes development in the physical, intellectual and spiritual sphere of man, the converse must necessarily be true. These are facts in science, which I shall constitute the basis and the premise of my syllogistic reasoning. "The blood is the life" is an infallible proposition, alike in nature and revelation. Without it there is no functional activity in any organ of the body. It is essential to the performance of the digestive process, and absolutely necessary in the accomplishment of intellectual labor. The power of thought initiated in the cerebral cortex is materially enhanced by culture, illustrated by the greater ease by which the student accomplishes his task a few days after his admission into the school room. If he devotes his attention solely to some physical pursuit, there is declension in the character and strength of his intellect. The same remark applies to the muscles, when confined by fracture appliances, revealed in their softened and debilitated condition, that unfit them for usefulness, and if continued for a long period would eventuate in their complete disqualification.

After a woman has passed the climacteric, less blood enters the organ, less nutriment is supplied, and the uterus becomes atrophied. Accepting this statement of facts, it is reasonable to conclude that fish inhabiting dark caves are blind from the absence of the stimulus of light, rather than from the result of accident.

While I entertain a high regard for scientific men of thought, and enjoy the literature of profound research, represented by these brilliant evolutionists, yet I prefer to accept the results of medical investigators whose brows are crowned with laurels in the temple of fame.

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## THERAPEUTICS OF POTASSIUM COPAIBATE.*

BY LOUIS KOLIPINSKI, M.D.,
OF WASHINGTON, D. C.

FOR nearly two centuries copaiba has been the standard internal remedy for the treatment of specific urethritis. Recommended by almost all writers, its popularity has never diminished. It has made fortunes for charlatans. Its use has spread into the hands of the laity.†

The first to recommend copaiba in venereal disease in such a manner as to make its use part of a system of treatment was Daniel Turner, M.R.C.P.‡ He writes: "In my own Practice after I have sufficiently Purged of the Virulency, or as the Quantity and Color of the Flux shall indicate; I usually finish with ℥i of the Balsam Copaiba called commonly Capivi, given at several times; *vel sub forma Electuarii cum Conserv. fruct. Cynosbat. vel instar Pastae albae. cum sacch. alb. praep. sumendo Alterutruis Quant. Nuc. Mosc. Maj. mane atque vesperi, ventriculo vacuo.*

"One Pot of this Composition hath very frequently completed the work; or if there be occasion, I repeat it once, twice, or perhaps thrice, if any Remains of the Gleet should so require, and this Remedy I prefer to any of the Terebinthinate Ones, or indeed any other of the natural Balsams whether *Gilcadense, Peruanum Opobalsamum,*

*Read at the meeting of the American Therapeutic Society, held at Washington, D. C., May 12, 1903.

†On the authority of the U. S. Treasury Department, Bureau of Statistics, there were imported into this country in 1899, 210,223 pounds of copaiba; in 1900, 202,092 pounds; in 1901, 212,082 pounds; in 1902, 235,194 pounds.

For the fiscal year 1902, 213,645 pounds came into the port of New York from the following countries: Brazil, 89,036, England, 60,438, Venezuela, 47,531, Colombia, 12,623, Germany, 2,300, Salvador, 253, Costa Rica, 96, Nicaragua, 378.

‡Syphilis, a Practical Dissertation on the Venereal Diseases, etc., London, 1717.

*Tolutanum* (all used by some Practitioners for this purpose) because I find it heals and binds less than the last; Nor is it such a Tell-tale as the former, where the Chamber Pot by its smell, discovers what has been done all over the House; besides it is less Naseous to many People's Stomach than the Common Turpentine, especially if taken in the Way I have here prescribed it. Indeed I have often wondered so few of our Writers have taken Notice of this noble Medicament, in finishing the Cure of *Claps* and of *Gleets* arising from thence; for which I believe very few Remedies can compare in the whole Physical Republick, and they who know rightly how to time it, may perform more in a Week than by all the other Methods now used, in a Month. I am sure I have known one Single Ounce thereof effect more in some of these Cases than a whole Pound of Turpentine, mixed up too as Mr. Wiseman directs cum *Pulv. Jalap. Crem. Tart.* et *Sale Prunel.* or than the *Chios* and *Cyprus* Turpentine taken alone in large Quantities."

Turner thus used copaiba only in the stage of decline of gonorrhea—an error copied from book to book since his time.

Of the few who have condemned copaiba may be mentioned J. L. Milton.* He writes with much repugnance but little reason. He warmly commends Thorn's preparation, to be next described, without apparently having had any practical experience with it. His praise, however, is both just and merited.

Three theories have been produced, claiming to determine the active principle of the drug, or the parts to which its virtues are due, of which the first is that of James Thorn,† M.R.C.S. The following extracts give the substance of this interesting essay: (pp. 7-8.) "The medicine which I have seen used with the best success (in gonorrhea) has been the balsam of copaiba given after the inflammatory symptoms have subsided: but the dislike generally expressed by patients on taking it,—the circumstance of its not being available in the inflammatory stage, detract from the value of this remedy. From these circumstances I was induced to try what would be the result of an analysis of the balsam, conceiving that its active principle might be very much concentrated and rendered more extensively useful when separated, than in the present form. By distillation, an essential oil was produced of a light green color having a most unpleasant smell and taste; it specific gravity being 0.876 to 1,000 water, leaving a brown resinous extract, quite soft, but becoming hard and brittle when cold; nearly tasteless and inodorous, soluble in ether and pure alcohol. The proportions obtained from two ounces of the balsam of copaiba were: eleven parts essential oil to five of extract, the respective merits of which I shall hereafter mention; and from the result I feel convinced that by separating the essential oil from the resinous extract, a very irritating and obnoxious part of the balsam is got rid of; and moreover, in the extractive resin all the virtues of the copaiba beside. . . . In the first stage (first twenty-four hours) may be given extract of copaiba with the most decided advantage in very large doses, from 15 grains to a scruple three times a day. . . . In the stage of gonorrhea in which the inflammatory symptoms are fully developed, which is generally within two or three days from the first appearance of the symptoms. . . . Unless the inflammatory symptoms are very excessive, and there appears any disposition from the previous history of the complaint to swelling of the testicle. I have given the extract of copaiba from 10 to 15 grains three times a day when first applied to, while the patient is affected with all the inflammatory symptoms." (p. 21.) " . . . It must be obvious that I do not recommend the extract of copaiba to be given while there is inflammation of the testicle or epididymis. On the contrary, it is better to resort to those means which will promote the discharge from the urethra, together with abstraction of blood from the scrotum, and such depletory measures as the circumstances of the case may require." (p. 23.) "The success of the application of the extract of copaiba in the inflammatory stage of gonorrhea may be doubted by many, from the circumstance of the balsam having been found not only of no use, but very prejudicial while inflammation of the urethra existed. But the sceptic on this point has only to take into consideration the difference between the preparations: that in the one there is an essential oil extremely irritating, and possessing qualities as hurtful as I can well conceive anything to be, for gonorrhea: while in the other there is only the pure resinous extract freed from the essential oil." (p. 45.) "There are some advantages, however, as a therapeutic agent, the extract possesses over the balsam, which it may not be amiss to mention more fully than has been done in any former part of this work. The first, which is that of its not producing the nausea, any disturbance of the alimentary canal, or the eruptions on the skin, which the balsam does." (p. 50.) "My opinion is that the frequent cause of the failure of balsam of copaiba, in curing gonorrhea, may be attributed to it (the variation in the quantity of extractive resin found) and that the good effects have been in proportion to the quantity of extractive resin the balsam contains."

Thorn thus was the first to use the acid resin—copaibic acid under the name of extract of copaiba. In a later work he commends it to be given combined with an alkali, hence practically a soluble copaibate. Thorn was correct in recognizing the curative power of copaibic acid in the disease when used from the beginning, also that the mass is more agreeable to take than is copaiba. In error, however, when he thought the

*On the Treatment of Gonorrhea without Specifics, London, 1862.

†Observations on the Treatment of Gonorrhea by a New Preparation from the Balsam of Copaiba, with Illustrative Cases. London, 1827, p. 57.

volatile oil acrid and irritating or that the acid resin will not disturb the alimentary canal or cause skin eruptions.

The second theory is that of the volatile oil. H. M. J. Desruelles* relates that in 1826, M. Dublanc, a distinguished chemist, thought the resin of copaiba is inert and conceived the idea to distil balsam of copaiba and to extract a volatile oil. This oil, to which a few drops of sulphuric acid is added, assumes a red or red-brown color and loses some of its bad odor and taste. The volatile oil with and without the addition of the acid was tried by Desruelles with success. In value he held 4 grams of the volatile oil to equal 16 of copaiba. M. Cullerier at l'hopital du Midi had similar good results.

The third and last theory is that of Bernatzik,† of Rocco da Luca and Amato, 1884, quoted by E. Finger.‡ They studied the action of copaibic acid and of copaiba oil on gonorrhea and came to the conclusion that neither of these two constituents when isolated has the action of the natural combination.

Bernatzik, in his much quoted article, says, when we recollect that the oil of copaiba stands in high physiological relationship to the resins; that therapeutically almost as active as they, though at the same time it is milder and hence mitigates the action of the resins on the intestinal and urinary tracts without detriment to the curative properties, one is justified in preferring the balsam in therapy to either of its constituents. The ethereal oil is the natural and most appropriate therapeutic co-agent and excipient and adjuvant to the resins. They, according to these recorded observations, act much too violently even in moderate doses, and in many cases, to increase the same or to continue their use is simply impossible. The greatest effect is to be found in using the thin variety of the balsam as being milder in action, due to more of the oil and less of the resin.

This study occupies itself entirely with the effects of the acid resin in alkaline combination. From both a lack of knowledge and experience the writer does not venture an opinion on the medicinal merits of the essential oil. The actions and effects of copaiba are too well-known to be described or discussed.

Copaiba, popularly and incorrectly called a balsam, is an oleoresin. Its sp. gr. is from 0.950 to 1.000 (Watt's Dictionary of Chemistry, 2nd ed.). It contains a levorotatory terpene (copaiba oil) $C_{20}H_{32}$, boils at 250° C. to 260° C., sp. gr. 0.900. The terpene from ordinary copaiba yields a crystalline hydrochloride $C_{20}H_{32}$ 4 HCl. The terpene from Maracaibo copaiba yields terephthalic acid on oxidation. It also contains (A. Wurtz—Dict. de Chimie pure et Appliqueé) two acid resins, the chief being copaibic acid $C_{20}H_{32}O_2$— it crystallizes. In composition it is the same as abietic acid. The other resin is viscid and uncrystallizable and seems to be a product of the alteration of the former.

Copaibic acid forms with bases combinations yet little known, soluble in alcohol and ether, insoluble in water. Potassium and calcium yield non-crystalline; lead and silver, crystalline salts. The amorphous resin seems to have the same chemical composition as the crystalline resin. It possesses the special character that it can be produced by the oxidation of the essential oil in contact with water, while the crystalline resin is produced only by the action of vegetation.

Metacopaibic acid $C_{22}H_{34}O_4$ has been found in Maracaibo copaiba and oxycopaibic acid, $C_{20}H_{28}O_3$ in Para copaiba.

Copaiba holds a variable quantity of essential oil. In some samples 30 per cent. was found, in a greater number, very little or none at all. The amount of volatile, which is given at 40 per cent. to 60 per cent. is higher than any copaiba examined by the writer. Probably most of the drug kept and dispensed in the shops contains very much less.

Potassium copaibate was prepared in the following manner: eight parts by weight of copaiba are mixed with one part of potassium hydrate dissolved in a small quantity of water. On agitation or stirring, saponification results. The mixture is allowed to stand for a few days. Three layers are then found to have formed. The uppermost contains the volatile oil, if present. The middle one is potassium copaibate; the lowermost is the residue of uncombined alkali in water. Thus made it has these properties: It is a clear fluid of reddish brown color. At 50° F. its consistency is gelatinous; at 63° F., thick and oily; at 70 to 80° F. it is quite liquid. Its taste is acrid and peppery; its odor similar to that of copaiba. The reaction is alkaline. It dissolves in alcohol, ether and chloroform. Its solution in water is opalescent; which soon becomes milky white from composition.

The alkaline copaibates have properties much alike. Potassium copaibate was adopted as the best of its kind because it is a more stable compound; is more convenient to handle; is more agreeable to take and more certain in its effects than the copaibates of sodium and of ammonium. The dose of potassium copaibate is from 50 to 150 grains a day. It is best taken in gelatin capsules No. O.O., so-called ten-grain ones. Four to twelve capsules represent the daily amount. The average man will tolerate two capsules thrice repeated. The robust with strong digestive powers, twelve. The weakly and those easily purged will not be able to take more than four for the same period of time.

The untoward effects of the copaibates are similar to those of copaiba, but not so severe, frequent or constant. A patient may give up copaiba ad nauseam, not so the copaibate. The after-taste, eructations and gastric oppression are but seldom mentioned by those taking it. Lumbar pains do not appear or are so slight as to escape comment. Overdoses produce strong laxa-

* Histoire de la Blennorrhee Urèthrale, Paris, 1854.
† Vierteljahrsch. für die Prakt. Heilkunde, 1868.
‡ Die Blennorrhieo der Sexual Organe und ihre Complicationen. 3. Ed., 1893.

tive effects without corresponding diuresis. Those of costive habit find the bowels regulated. The proper dose apportioned to the individual seems to improve the digestion; is without purgative effect and increases the urinary secretion.

It produces skin eruptions—roseola and urticaria—as does copaiba and these occur only in susceptible individuals from any dose, large or small. In a daily experience of several years, four such instances of drug exanthem were observed.

The following is the history of one showing that it remains with the judgment of the practitioner to continue the remedy or not.

*Case I.*—Waiter, aged twenty-three years, married. A gonorrhea, first infection, of three weeks. Treatment: Self medication with injections and copaiba emulsion. Present condition: purulent urethral discharge, pus and shreds in the urine; urination urgent and frequent. A copaiba roseola, slight on face and neck, more abundant on forearms and hands; much itching; has been out some days. He took two capsules of the copaibate at noon and the same number at 4 o'clock in the afternoon. In the evening the rash was much intensified; the patient greatly frightened. The roseola had changed to a very active urticaria. He complained greatly of the itching. The face, neck and hands were swollen. The copaibate was suspended, and the next day the second eruption had disappeared, nor did it or the first one return. He resumed the copaibate at once taking twelve grains every three hours. Treatment ceased a week later, patient being cured.

*Case II.*—A young man with acute gonorrhea, first infection, complicated with peri-urethral abscess posterior to the corona glandis, developed a very abundant rash within two days from taking the average doses of the copaibate. On the limbs the roseola was discrete and sparse; on the trunk, especially the whole of the anterior surface, it was very densely placed. It disappeared on omitting the copaibate and substituting sandalwood oil. In three days the patient, of his own volition, resumed the copaibate in the original dose; the exanthem did not reappear.

The copaibate of potassium is a soap. Used as such it will be found to be actively detergent, antiseptic in a moderate degree and of an odor more or less aromatic. It is useful in some cutaneous diseases. The writer has cured with it chronic eczema of the hands and of the legs. Acne vulgaris and acne rosacea are improved by applying it undiluted and removing it by washing with water as soon as burning begins to be felt. Two or three drops to a fluid ounce of water offers a solution which is an agreeable cleansing and palliative spray in catarrh of the nose and throat. In laryngeal catarrh and in the hoarseness and enfeebled voice of singers and speakers it has been much praised by patients. Applied undiluted on pledgets of gauze on ulcerating cancerous tumors it removes fetor, arrests purulent and putrid discharges and prevents hemorrhage. Its internal uses are like those of copaiba; its more particular actions are these. In anuria of the non-obstructive form it has been successfully used by the writer. In acute cystitis it often effects a cure and its power is more marked in women than in men. Chronic cystitis is palliated; pain and tenesmus relieved. The urine is less loaded with pus and mucus; decomposition is less active.

In diseases of the respiratory tract, of the stomach and of the intestine, no action worthy of note has been observed. In cholelithiasis or gall-stones it has been found very useful. It compares favorably with the treatment by olive oil or the use of Carlsbad water, whether in the latter instance the patient be treated at home or is able to sojourn at this or that mineral spring. Not alone does the copaibate prevent attack of biliary colic but also when this has occurred the resultant jaundice is shortened in duration; the period of prostration is much lessened and recovery very much sooner attained. Gall-stone disease is common and the cases suitable for surgical operation are comparatively rare. Therefore the multitude that suffers from minor gastric disturbance, transient pain and occasional attacks of acute obstruction and expulsion is the proper class for which the copaibate can be commended. How the copaibate acts is obscure. It is not a solvent of a biliary stone.

The following short record narrates a case of infrequent severity:

*Case III.*—A young mother, with an infant of six months at the breast, had had from one to three attacks of hepatic colic every week for five months. Formerly of stout figure she had grown weak and emaciated. Some paroxysms were succeeded by jaundice, the greater number were not. The fundus of the gall-bladder on palpation was enlarged and very tender. As medical treatment had so far failed, the patient was willing and anxious for surgical relief, but was deterred from this step by the fear of ill health in her nursling. She took the copaibate steadily for three months. The attacks ceased, and at present after a lapse of eighteen months she has remained in apparent perfect health. In this one the diuretic power is recorded.

*Case IV.*—A young, delicate woman had a gall-stone to pass without any intense pain: the whole was over in half a day, and she did not call for medical aid. She had had a like attack two years before. The next day jaundice appeared. She was so weak as hardly able to be about. There was no desire for food. She was given 12 grains of the copaibate four times a day. The jaundice disappeared completely in forty-eight hours.

The chief use of the copaibate is found in acute gonorrhea. In the stage of gleet it is unavailing. Of the copaibate in specific urethritis it may be said: the proper dose can be steadily pushed for from one to three months without unpleasant reaction. Occasionally a copaiba erup-

tion appears on beginning its administration due to idiosyncrasy. The copaibate is a powerful diuretic increasing the secretion of urine 25 per cent. This effect cannot, however, be prolonged indefinitely in all cases. In a few instances it was observed to set up a polyuria. This polyuria disappears in a week, on the omission of the medicine. It is possible, however, that a grave form of insipid diabetes may begin and in old subjects with chronic inflammation of the bladder or other portion of the urinary tract life itself may be thereby endangered.

The course of an uncomplicated case of gonorrhea treated with the copaibate terminates often in complete cure in from one to two months.

In an early urethral infection, the copaibate if begun at once may in rare examples produce a cure in a few days.

Where a heavy purulent or sanguineopurulent discharge shows itself, and the whole organ is hot and turgid, it mitigates in a high degree the scalding pain of urination and chordee is hardly ever felt. At the end of two or three weeks the discharge begins to abate and often somewhat suddenly.

The chief merit of the copaibate is to be found however in that it reduces the danger of complications to a minimum, so that gonorrheal bubo, epididymitis, Cowperitis, prostatitis, vesiculitis, cystitis, and stricture are seldom seen to arise. Upon the prevention of gonorrheal rheumatic infection an opinion cannot be expressed for want of cases so far encountered.

Potassium copaibate possesses the virtues commonly assigned to copaiba with some special ones due to its solubility. These are its uses on the skin and mucous membranes for its alkaline, detergent and antiseptic properties; its lesser tendency to disturb the economy by producing gastric and intestinal irritation. Further, it is much more palatable than copaiba. It is true that it produces the copaiba exanthems, but this need not of necessity cause its discontinuance.

## MEDICAL PROGRESS.

### MEDICINE.

**Influence of Adrenalin on Muscular Contraction.**—At the close of an interesting paper dealing with the effect of adrenalin and other glandular products upon muscular contractions, J. IOTEYKO (Jour. Méd. de Bruxelles, July 9, 16 and 23, 1903) thus sums up the subject: (1) The richer the muscle in sarcoplasm the more energetically does adrenalin act upon it. It is a sarcoplastic excitant. (2) Other glandular products, such as extracts of the thyroid gland, the hypophysis, testicle and ovary have a similar influence. (3) The term "physiological poisons" is proposed for the products of these glands, which, acting chemically upon muscle tissue and especially upon the sarcoplasm, have power to augment the muscle tonus. This increased tonus is most apparent when the muscle is subjected to electrical excitation; a condition most favorable to contraction having been created thereby. It may be concluded that the tonus brought about chemically in the muscles by these glandular products is a physiological phenomenon which facilitates the action of the nervous stimuli and constitutes a preparatory stage to contraction. Thus these substances might be called "sensibilisatrices" their rôle being the augmentation of the sensibility (receptivity) of the muscle to the nervous stimulus.

**Typhoid Paralyses.**—Of the forms of paralysis depending upon typhoid infection, monoplegia is most frequently seen according to S. CERAULO and G. GRANOZZI (Gazz. Siciliana de Med. e Chir., July 2 and 9, 1902); hemiplegia and paraplegia being of rare occurrence. The appearance of paralysis seems to bear no relation to the gravity of the disease; this complication sometimes occurring in the lightest cases, while the most severe may run their course without any form of paralysis. Monoplegia is usually preceded by a sense of numbness, weakness and coldness followed by pain, which may be very severe and persist after the paralysis has subsided. The latter may last from a week to several months and is accompanied by abolition or diminution of tendon reflexes and sensibility. Hemiplegia may appear in the course of the disease, but usually appears during convalescence; and its onset is generally sudden. Paraplegia also makes its appearance, as a rule, during convalescence. In a few cases paralysis may extend to the pons and give rise to the symtoms of Duchenne's subacute general paralysis; in others, one of the cranial nerves may be involved; and in one instance, paralysis of one of the abductors of the vocal cords necessitated tracheotomy. Lastly, disturbances of speech may occur in the course of the disease or during convalescence; and children are especially prone to aphasia. As to the pathogenisis, a toxic neuritis or lesion of one of the nerve-centers is generally responsible for the monoplegias. Not so, however, with the hemiplegias, which may be ascribed to thrombosis or embolism of the sylvian artery or else to hemorrhage. Paraplegia is, for the most part, due to polyneuritis or to a medullary lesion. The transitory aphasias of children—generally of toxic origin—are to be distinguished from those of adults, which are often associated with obliterating endarteritis of the slyvian artery, embolism or thrombosis. The prognosis is good in most cases of typhoid paralysis. Intoxication being directly or indirectly responsible for such affections, elimination of the toxins should be promoted by free diuresis and other measures. Tonic treatment, massage, baths and electricity all contributed their quota toward the cure of typhoid paralysis.

**Vaccinal Delirium.**—The description of three cases of delirium following vaccination is given by E. RÉGIS (Jour. de Méd. de Bordeaux, July 26, 1903), as reported to him by three of his confrères. All, he believes, were of the type of toxic and infectious delirium. The initial headache and fever were followed by delirium with terrifying delusions; nocturnal only, in the lighter cases and persisting during the day in the more severe. The delirium appeared in each case during the inflammatory period following vaccination and rapidly disappeared with the suppurative stage.

**The Fixation Function of the Liver.**—As the result of a series of experiments, A. PI Y SUÑÉR (Rev. de Cien. Méd. de Barcelona, No. 4, 1903) has reached the conclusion that elimination by the urine of derivatives of hemoglobin does not occur when the liver cells are in normal condition; these substances being intercepted and held—or "fixed," as the author expresses it—by the liver and converted into biliary coloring matter. Injections into healthy animals of hematoporphyrin in solution failed to induce the appearance in the urine of the spectroscopic image characteristic of that pigment; but in animals whose livers were dam-

aged by prolonged feeding with small amounts of phosphorus, such injections were followed by free elimination of hematoporphyrin.

**Immunization Against the Plague.**—Immunization against this disease by means of attenuated cultures of the plague bacillus has lately been made the subject of experiment by W. Kolle and R. Otto (Deut. med. Woch., No. 28, 1903). They failed to find any benefit resulting from the use of the Haffkine method and showed that the immunity, when present, lasted only about six weeks. The authors believe that the injection of avirulent living cultures of the plague to be the only method of effectively immunizing against the disease. They secured avirulent cultures by long cultivation at 40° C. of a particularly non-virulent culture. Three loops of this culture, which is more than 3,000 times the dose of a virulent culture, could be injected into guinea-pigs without producing symptoms. Complete immunity could be conferred on laboratory animals which lasted for months by a single injection, with no signs of infection and merely a small increase in the number of plague germs at the point where the injection took place.

**Auscultatory Percussion to Determine the Size of the Heart.**—Some years ago it seemed as if we had acquired a valuable aid in physical diagnosis by combining percussion with auscultation either by means of the ordinary bimanual stethoscope or the phonendoscope. It was even announced that the different chambers of the heart could be marked out upon the chest-wall with considerable accuracy. Much of the enthusiasm, however, is apt to subside after one reads the article of F. Moritz (Münch. med. Woch., Aug. 4, 1903). It appears that this author has compared the figures he percussed with the X-ray shadow and has found the former to be wrong in nearly every instance. Heart-shaped tracings can be projected upon many different parts of the body for the change in sound depends upon a variation in the tension of the skin and not upon any underlying organ. The method is so unreliable that he cannot warn enough against its use.

## SURGERY.

**The Epidemic Nature of Appendicitis.**—A very complete monograph on appendicitis by Rostovtzeff forms an important contribution to the subject. He does not recognize the epidemic nature of the disease, contrary to N. Golouboff (Prakt. Vratch, No. 29, 1903), who in 1897 put forth the view, as based on clinical data, that inflammation of the vermiform appendix was an epidemic infectious disease. In this opinion he is supported by no less an authority than the famous French surgeon, Lucas-Championnière, who considers appendicitis as a new disease of an undoubtedly epidemic character and especially prevalent in England and in the United States. Prof. Charrin, of Paris, considered the subject important enough to conduct a series of laboratory experiments, the results of which he embodied in a "Report on Experimental Epidemic Appendicitis." There is no doubt that many of the most prominent surgeons seem to be inclined to consider appendicitis as an epidemic, infectious disease, and the more the disease is being studied the stronger becomes this view. Dieulafoy goes so far as to call appendicitis maladie toxi-infectieuse. The author finds that in appendicitis, as in other infectious diseases, there occur icterus, acute nephritis, multiple arthritic inflammations, etc.; he even observed in two cases enlarged spleens. In contending the author draws the following: (1) Appendicitis is an infectious disease. (2) In many of the cases appendicitis appears as a primary, independent affection of the appendix, in the way that tonsillitis represents an inflammation of the tonsillary glands. (3) During the last eight to ten years the number of appendicitis cases has increased progressively, taking the character of an epidemic, or even endemic prevalence. (4) This prevalence is of a distinct, undoubted nature, as observed by Sonnenburg in 1899, in certain localities in Berlin and Frankfort.

**Filling Bone Cavities.**—The most successful method heretofore devised for filling up cavities in bone produced by operation or otherwise, has been by means of the decalcified bone plates of Senn. Barth and Valan were able to show, however, that only a connective tissue scar resulted from the implantation of decalcified bone, while the insertion of macerated or calcined bone was followed by the formation of new osseous tissue which completely restored the defect in the skeleton. The activity of the osteogenetic process in the newly implanted area depends mainly on the inorganic bone salts present which are made use of in the formation of the new bone. Valan has also shown that all the calcium salts exert a favorable influence in this process, and the activity of the latter is directly proportionate to the similarity of the chemical relations between the implanted calcium salts and the inorganic substances in the bone. The spongy character of calcined bone also favors penetration by the osteogenetic elements. Practical application of this theory has lately been made by G. Fantino and A. Valan (Archiv f. klin. Chir., Vol. 70, No. 3) in some 40 cases where bone cavities existed as the result of necrotomies or tuberculous processes. Complete disinfection of the cavity was obtained by thoroughly scraping out the cavity and then filling it with a 10-per-cent. emulsion of iodoform glycerin. This was brought to a boil by inserting the thermocautery point for a minute or two, and bacteriological examination proved this to be a most effective measure. In clean tuberculous cases the cavity may be filled up at once, but after necrotomies it is better to wait a few days, until it is certain that the wound is running an aseptic course. The authors employed the os spongiosum of the calf in their work, after prolonged maceration and boiling and then calcining. The cavity is entirely filled up so that no vacant spaces remain. In cases where the neighboring soft parts are healthy the wound may be entirely closed by suture, and here the process of substitution has been observed to occupy only four months or even less. In cases of acute osteomyelitis and suppurating tuberculous processes failures were often noted on account of the inability to maintain the asepsis or to completely fill all the crevices. Success was finally obtained with a mixture of the bone ash and a compound of thymol and iodoform (1:2), equal parts. This combination is fluid at 75° C. and of almost stony hardness at body temperature. After six months it was found in one case that the implanted material had largely disappeared, the new growth of bone having almost completely absorbed it. It is important that the wound and its surroundings be kept absolutely dry. In all the cases, taken together, the results were almost uniformly good and the process of replacement was complete in from three to eight months.

**Cartilage Changes in Tuberculous Joint Disease.**—For many it has remained an undecided question, whether the changes in the cartilages in a tuberculous joint were of a retrogressive or a progressive nature. A recent contribution to this subject has been made by Schablowski (Archiv f. klin. Chir., Vol. 70, No. 3), who had the opportunity of examining a large number of specimens, principally resected tuberculous knee-joints, and several cases of gonorrheal and syphilitic gonitis. A summary of his descriptions shows that, aside from the various retrograde changes in the carti-

lage, there are also others of a progressive nature. The cartilage, in certain cases of joint inflammation, does not assume a passive rôle and become substituted by connective tissue, similar to the process which takes place in a thrombus, but takes an active part in the formation of the connective tissue. He found that the cartilage cells in some instances became converted into fibroblasts, which increased in size toward the surface. At the same time the cartilaginous spaces also enlarged until they finally were in direct communication with the overlying granulation tissue and also became invaded by vascular processes from the latter. From this time on there is a rapid increase of cells within the spaces, until the cellular contents of the latter have become an integral part of the granulation tissue. He was unable to distinguish any marked differences in the cartilaginous changes on the articular aspect from those on the bony side. A conversion of cartilage cells into pus cells or red blood cells was never observed.

**Diagnosis of Thoracic Tumors.**—A practical method for the diagnosis of malignant intrathoracic tumors is suggested by A. FELD (Deut. med. Woch., 1903, No. 28). He has observed two cases in which the diagnosis was made from the finding of particles of tumor tissue in the sputum. In all suspected cases where hemorrhagic sputum is present he advises their examination against a black background for small bits of tissue, which should be isolated and again viewed after proper preparation under the microscope.

**Protection Against the X-rays.**—The danger to which an operator is exposed by employing his own hand or arm as a test object in gauging the quality of his tubes, has led to the production of numerous protective devices. None of these has fully met all indications. CARL BECK (Berl. klin. Woch., Aug. 10, 1903) publishes an ingenious suggestion, which consists in the substitution of a prepared skeleton of the arm for that of the operator. These bones, properly mounted, may be attached to a piece of pasteboard or other material transparent for the X-ray. The shadows of the bones, just as in the living member, are black when soft tubes are used, and light gray when the harder tubes are employed. This test object may be readily manipulated by the operator, without the latter coming within the radius of action of the rays.

**Osmic Acid in Trigeminal Neuralgia.**—An additional case of this complaint treated by the intraneural injection of osmic acid after the method of Bennett, of London, is reported by J. B. MURPHY (Jour. Am. Med. Ass'n, Aug. 22, 1903). The patient, a man of seventy-six years, presented a trigeminal neuralgia of long standing, resistant to ordinary treatment and incapable of radical operation on account of the general debilitated condition. The injections in this case were given under ether anesthesia, the nerve being exposed directly over its foramen of exist and from 5 to 10 minims of a 1.5-per-cent. solution of osmic acid injected with a hypodermic needle into its substance. A small amount of the solution is also injected between the nerve and its sheath in the bony canal, but care must be taken that none of the fluid gets on the skin. Recovery was uneventful and the wounds healed by primary union. No recurrences of pain have been noted at any time since the operation. The author thinks that the acid probably acts by producing a degeneration of the nerve on the proximal side of the injection, toward the ganglion, rather than by causing a local destruction of the nerve and its terminal filaments. He thinks the former is more likely, because the pain does not subside completely immediately after the operation, as it does when the peripheral nerves are cut, and as it would if the osmic acid produced only a local destructive effect. Instead it subsides slowly and gradually. Moreover, the relief from pain is permanent, which is not the case after peripheral resection. A number of experiments on dogs is now being conducted by the author, which, it is hoped, may throw some light on the changes which take place after the injection.

**Forensic Importance of the Roentgen Rays.**—Every physician who is liable to testify in court should make a special study of Roentgen diagnosis and should be thoroughly conversant with the structure of the epiphyses of the various bones and of the appearance of abnormal bones. D. TROEGER (Friedreich's Bl. f. gericht. Med., Vol. 54, No. 4) believes that an X-ray photograph discloses better than anything else the presence of fractures and dislocations and their effect upon the bony skeleton with exception of the head and vertebral column, where the pictures frequently are not as clear as desired. Foreign bodies, if sufficiently large and of proper material, can be well located. For internal disease, the old methods frequently are more reliable, and absolutely no information can be obtained as to whether a newly born child had breathed during or after birth, or if pregnancy is present. The examiner must have experience extending over several years before his opinion can be accepted as conclusive.

**Spontaneous Cure of an Intussusception.**—A patient, sixty years old, is suddenly seized with severe colic and all symptoms of intestinal obstruction rapidly follow. Seventeen days later diarrhea sets in and a piece of ileum 32 centimeters long is passed. Eight days after this the patient was able to eat solid food without any disturbance. H. SCHRIDDE (Münch. med. Woch., July 28, 1903) was fortunate enough to do an autopsy since the woman died several months later from some pulmonary affection. A narrow, perfect scar was found encircling the ileum 36½ centimeters above the ileocecal valve. Stenosis or adhesions were absent. Like in most cases of intestinal obstruction, the etiology here was not clear. Perhaps foreign bodies play a more important rôle than we think. A thin and weak mesentery is certainly a predisposing cause. Paralysis of a circumscribed portion of the intestines hardly ever occurs, yet irregular contractions of the gut are probably always present and the peristalsis is considerably increased above the site of obstruction. The invagination does not increase in size by a vis a tergo, but probably by excessive peristalsis at the head of the invaginated portion which forces this further toward the anus.

## NEUROLOGY AND PSYCHIATRY.

**Landry's Paralysis.**—This rare and interesting condition was carefully studied by D. ROLLY (Münch. med. Woch., Aug. 4, 1903) who had occasion to observe seven cases. The disease began in all with certain prodromal signs, among which a feeling of lassitude was most complained of. In a short time, paresis of the legs became pronounced and the process then extended upward to the trunk, arms and neck. In two cases the facial nerve was involved and in two the muscles of respiration. There generally is no fever during the onset or at most only a slight rise of temperature and pain does not form a prominent sign at first. Throughout the course the reflexes are absent or much diminished and reaction of degeneration will appear eventually. Ataxia is occasionally present, muscular atrophy appears late and the functions of bladder and rectum are generally normal. No new facts could be ascertained as to etiology, like in so many cases previously published, no cause for this serious illness could be found in some while in others there was the usual history of alcoholism, syphilis and

overexertion. The author looks upon the disease as an acute, ascending neuritis and believes that if the finer nerve-endings in the muscles were to be examined with modern methods, change would always be found. The process has a tendency to creep up along the nerve-trunks into the cord but lesions are found here only if the disease runs a more chronic course. It is often hard to differentiate from acute polyneuritis but here some muscles of each extremity generally escape and the upward extension of the paralysis may be interrupted by days and even weeks of apparent quiescence. The two conditions really belong to one and the same class.

**Clinical Observations in Acute Mania.**—The continuous examination of the blood in four cases of adolescent mania by L. C. Bruce (Jour. of Mental Science, July, 1903), corroborate the observations made by the same author upon the blood of patients suffering from acute continuous mania, namely, in every case there was a persistent leucocytosis, which immediately prior to an attack of mania fell somewhat, then during the attack rose, perhaps as high as 40,000 per c.mm. of blood, and during the periods of interval fluctuated between 13,000 and 27,000. During attacks the polymorphonuclear cells were relatively increased but at other times averaged 60 per cent. Having isolated from the blood of a case of acute continuous mania, a very small coccus, the author found that the blood of the cases of acute adolescent mania (a form of recurrent mania occurring in adolescents) like that of the cases of continuous mania, had the power of agglutinating the organism completely in a dilution of 1 in 20. The serum of six other cases of adolescent insanity which did not present the clinical symptoms of recurrent mania, failed to agglutinate the same organism. The clinical symptoms, the leucocytes and the agglutinative action in the adolescent cases, compared with the same symptoms in acute continuous mania, show a striking resemblance. Everything points to the fact that they are the same disease process modified by the age of the patient. The author treated on purely empirical grounds four cases of adolescent mania with antistreptococcus serum. While injected subcutaneously the serum produced no result, when given in 10 c.c. doses by the mouth, the following were the results obtained: In Case I there was absolutely no result. In Case II, within thirty minutes of the administration of the serum, the patient became quieter, the pulse fell from 10 to 15 beats in the minute, and the temperature fell 1°, but the course of the attack was not arrested. In Case III, within fifteen minutes of the administration of the serum the patient regained self-control, the pulse and temperature fell and the effect lasted for about two hours. A second dose of 10 c.c. arrested the attack. Two subsequent attacks were arrested in the same way. The patient made a good recovery, which the author attributes to the action of the serum. In Case IV the administration of the serum also seemed to arrest the attack. The author believes that this empirical experiment lends support to the view that acute mania is an infective disorder.

**The Pathogenesis of Disease Following Unsuccessful Attempts at Hanging.**—A detailed study of three cases of insane individuals who made attempts at suicide by hanging, but were rescued, was undertaken by W. Alter (Monatsschrift f. Psychiatrie u. Neurol., July, 1903). All three had been cut down after a relatively short time of suspension and resuscitated. They presented absolute unconsciousness. One breathed spontaneously, in the others artificial respiration was necessary. Pulse in Cases I and III good, in II small, in all rapid; the pupils dilated but still react. In from twenty to thirty minutes phenomena of motor irritation set in, in II and III accompanying the improvement in respiration. These phenomena began characteristically in all three with tonic and clonic twitches, passing into general convulsions accompanied by enuresis, biting of tongue and opisthotonus. Remarkable are the kicking movement of the legs and the waving of the arms seen in Case II, in which strangulation had continued the longest. This condition is soon followed by a catatonic rigidity of the entire body with contractions of the sphincters. The motor unrest in Case II is repeated twice in the course of three or four hours. All three cases wake up suddenly but reveal a certain amount of cloudiness of consciousness. A marked amnesia for the attempted suicide and its consequences is present in all cases, lasting for from two to six days. A certain amount of retrograde and anterograde amnesia is present. Motor unrest continues for a variable period. The clinical manifestations, as above detailed, represent, in the author's opinion, an intoxication psychosis of the acutest form—a transitory psychosis in the sense implied by Wernicke They originate in a lesion of cellular elements whose extent is dependent upon the duration and extent of the strangulation, the cells damaged being chiefly those of the cortex cerebri and to a less degree those of the interior of the brain. Hence there result epileptiform attacks, convulsions and the complicated stereotyped motile phenomena, which may be regarded as the result partly of irritation and partly of degeneration. A hysterical individuality can influence but not originate the clinical picture.

**Changes in the Nervous System in Porencephaly.**—The paucity of the cases in which a detailed study of the changes occurring consequent to porencephaly, has been made, imparts considerable value to the investigation made by J. O. W. Barratt (Jour. of Mental Science, July, 1903) on a case of porencephaly which, without any history of traumatism, began at the age of eleven months with eclampsia, and with the continuance of this condition, terminated in idiocy. At thirty years of age the patient was admitted to the asylum and died nearly three years afterward. At autopsy the following changes in the nervous system were found: There was a defect in the brain mantle on the left side involving the aperculum, the island of Reil and the superior temporal convolution. The floor of this area was formed by the subjacent white matter which was very defective in medullated fibers. The left hemisphere was small and had contracted upon the area of defect, the left temporal lobe, seen from below, was also defective in size. The inferior longitudinal bundle on the left side was defective. As the destructive lesion of the temporal lobe was confined to the superior temporal convolution, it follows that the defective nerve-fibers arose in this gyrus. The caudate and lenticular nuclei were unaffected. The left optic thalamus was atrophied, the atrophy involving the lateral median and ventral nuclei (especially the latter) while the anterior nucleus was unaffected. The left optic radiation was atrophied. The atrophy of the optic thalamus was entirely dependent on the cortical lesion, being outside the vascular area involved in the latter. The cortico-spinal and thalamospinal tracts coming from the left hemisphere were markedly wasted in the mesencephalon, pons and medulla in comparison with the corresponding tracts of the other side. The cerebellum was normally developed. The spinal cord exhibited a defect of the left antero-internal column, while the right anterolateral column was of defective width opposite the base of the anterior horn. There was also diminution in size of the right anterior horn. The

lesion was obviously vascular in origin, corresponding very closely to the area of distribution of the left middle cerebral artery—which must have been blocked just beyond the point at which the lenticulostriate branches are given off. The blocking may have been the result of an embolus detached from a cardiac valve exhibiting vegetations, for at the autopsy valvular heart disease of old standing was found.

## HISTOLOGY, PATHOLOGY AND BACTERIOLOGY.

**Researches on Tetanus.**—The results obtained by H. MEYER and F. RANSOM (Proc. of the Royal Society, July 8, 1903) include an experimental explanation of so-called local tetanus, a satisfactory interpretation of the period of incubation, the discovery of a form of tetanus confined to the sensory system, called tetanus dolorosus, a theory of the action of tetanus toxin and a definition of the sphere within which the serum treatment of tetanus is effectual. The authors believe they have succeeded in demonstrating that the transport of tetanus toxin to the central nervous system takes place only by way of the motor nerves, on the basis of the following experimental proof: (1) Toxin was found in the motor nerve after subcutaneous injection in a hind leg; (2) the endangered spinal centers can be protected if the passage of toxin along the motor nerve be blocked by means of antitoxin injected into the substance of the nerve; (3) if a lethal dose of tetanus toxin be injected into the sciatic nerve of a cat, the first symptom is a local tetanus of the muscles of the injected limb. This is followed seriatim, after a certain period during which the other hind leg is usually attacked, by tetanus of the trunk, fore legs, muscles of the neck. Such a progression of the disease from the hinder to the fore parts of an animal, can, under certain conditions, be prevented by section of the spinal cord. (4) A dose of toxin which, if introduced under the skin, causes no, or but slight, symptoms, is often sufficient to produce death if injected into a motor nerve. (5) Even when the blood contains a large quantity of antitoxin it is still possible to produce tetanus by injecting toxin into a motor nerve, although, under similar circumstances, subcutaneous or intravenous injections call forth no symptoms whatever. As regards the period of incubation, the authors find that the greater part of this is the expression of the time occupied in the conveyance of the toxin from the periphery along the motor nerves to the susceptible centers. The exaggeration of the reflexes and the characteristic tetanic rigidity of the muscles are due to the action of the toxin on the nervous centers to the entire exclusion of the periphery. In the experiments with injection of tetanic toxin into the substance of the spinal cord, the authors observed, as the first symptom of intoxication, an extremely remarkable sensory disturbance which remained strictly localized, even when the muscular rigidity and the exaggeration of the reflexes were becoming general. In several cases this was so great as to lead to death even before the ordinary symptoms of tetanus were clearly developed. This symptom, known as tetanus dolorosus, consisted in extreme hyperesthesia of some part of the periphery corresponding to the spinal center into which the injection had been made. This overirritability of the pain-reflex apparatus never occurs after simple subcutaneous or intravenous administration of the toxin, nor after administration into a nerve trunk. On the other hand, if the toxin be administered direct into a posterior root the result is pure tetanus dolorosus, thus indicating that the spinal ganglion forms an insuperable obstacle to the transport of the toxin. The reflex answer to the attacks of pain consists in coordinated defense movements, *i.e.*, brain reflexes. The pain apparatus in the spinal cord is so insulated from the motor that an intoxication of the one group cannot go over to the other. The actual movement of toxin in the nervous system takes place not in the lymphatic but in the protoplasm of the nerves. The toxin may possibly be carried centralwards in a sensory nerve, but sensory disturbance cannot be caused in this way. The heart-retarding centers of the vagus are susceptible to tetanus toxin. The tonic rigidity of the muscles and the exaggeration of the reflexes are due to entirely different and independent processes. Reflex tetanus is known to be a discontinuous series of contractions of short duration. The tetanic rigidity of the muscles, on the other hand, is a continuous and gradually increasing shortening, which may, however, regress. This shortening, when it has existed twenty-four to thirty hours is not affected by curare nor by section of the nerve. The theory of experimental tetanus intoxication assumes that the toxin is taken up from the point of injection by the motor nerves. Passing along these it reaches first the motor centers in the cord and excites there an overirritability, so that the discharges, which in the norm only give rise to the so-called muscular tone, become abnormally strong (although not reaching the maximum at first). The extensors and flexors of the injected limb brace themselves more and more and in the hind limbs the extensors tend to overcome the flexors. This, however, takes place gradually, so that for a considerable time voluntary and reflex movements can be executed. It may be said that tetanic rigidity is an intensified muscular tone in the affected limb. The excess toxin is next carried in the fibers of the cord to the motor apparatus of the correponding limb of the other side. After a time, and if enough toxin has been given, the nearest connected sensory apparatus of the reflex arc in the spinal cord is attacked, with the result that the general reflex movements following irritation of the injected limb or its nerve are exaggerated, though from all other parts of the body normal reflexes are excited. The authors found in repeated experiments that when tetanus toxin was introduced direct into a motor nerve, antitoxin, though present in large quantities in the blood, was unable to prevent the outbreak of the disease or even to hinder a fatal issue. They conclude that injected antitoxin does not reach the substance of the nerve fibrils and centers, and that even with highly immunized animals the neurons remain free from antitoxin. As regards the value of the serum treatment of tetanus, it is clear that any toxin which is already in the nerve substance, though not yet in the spinal cord, cannot be reached and neutralized by antitoxin, whether given under the skin or direct into the blood. An attack corresponding to the amount of toxin absorbed by the nerves will infallibly break out and run its course in spite of the antitoxin. On the other hand, the toxin still in the blood and lymph will be rendered harmless by an injection of antitoxin, the absorption of fresh toxin from the infected wound hindered, and in this way an otherwise fatal result may be prevented and the life of a tetanus patient saved.

**The Immunizing Effects of the Intracellular Contents of the Typhoid Bacillus.**—It has been shown by Allan Macfayden that it is possible to disintegrate mechanically the typhoid bacillus at the temperature of liquid air and to obtain the cell-juices of the organism. In inoculation into animals these cell-juices proved toxic or fatal. It was, therefore, concluded that the typhoid bacillus contains within itself an intracellular toxin. The same author (Proc. of the Royal Society,

Vol LXXI, No. 473), in testing the typhoid cell-juices for immunizing and other properties, finds that by their injection into the monkey it is possible to obtain a serum with both antibacterial and antitoxic properties, and that such a serum possesses curative and preventive properties as regards the typhoid bacillus and an intracellular toxin present in the same organism. The author believes that this research has afforded for the first time proof that, in the case of one species of pathogenic bacterium, the intracellular juices of the organism, when injected into a suitable organism, give rise to the production of a serum which is both bactericidal to the organism itself and antitoxic as regards a toxin contained in its substance.

**Cytodiagnosis in Pleural and Peritoneal Exudations.**—The diagnosis of the character of an exuded fluid into one of the serous cavities of the body has received a valuable aid by the examination of the cellular elements deposited in it. This is especially true in tuberculosis, for despite staining for bacilli, animal inoculation, tuberculin test and the more recent agglutination, we still lacked a quick and certain method of diagnosis. A critical review upon the advantages of cytodiagnosis based upon a large number of experiments, is found in the careful dissertation of L. v. Ketly and A. J. Torday (Deutsch. Arch. f. klin. Med., Vol. 77, Nos. 1 and 2). In primary tuberculous pleurisy, the deposit consists of a large number of small lymphocytes mixed with more or less red corpuscles, throughout the entire course of the disease, while endothelial cells occur only in few numbers. The same holds true for secondary, acute, tuberculous pleurisy except that in the first few days there may be predominance of polynuclear cells and endothelial elements. A chronic tuberculous pleurisy can hardly be distinguished from the chronic processes accompanying Bright's disease or heart trouble, by means of cytodiagnosis since polynuclear cells, lymphocytes and endothelial cells occur in varying numbers in both and disintegration very often does not permit one to discern the character of the cells. The ascitic fluid of Bright's disease and endocarditis contains many endothelial cells and later lymphocytes and still later there may be close resemblance to the deposit in chronic, secondary tuberculous pleurisy. The exudate following a pulmonary infarct, if chronic, hardly differs from that of nephritis. Pleurisy due to the pneumococcus gives a fluid containing many polynuclear leucocytes and endothelial cells. Cytodiagnosis is thus of value particularly in the diagnosis of primary, tuberculous pleurisy. An acute onset with marked lymphocytosis is characteristic here. Where the course is chronic, however, one must rely more upon the clinical aspect of the case. Cytodiagnosis will thus aid in giving a prognosis in acute cases, while it will not materially influence the treatment.

**Pathology of Tetany.**—As a result of clinical observation on 77 cases, and careful autopsy on seven, with microscopical examination of the cord and nerve-roots, R. Peters (Deutsch. Arch. f. klin. Med., Vol. 77, Nos. 1 and 2) reports as follows on the anatomical changes in tetany such as is common in children from three months to three years: Tetany is not a functional but an organic disease. Its chief lesion is on inflammation of the extradural connective tissue which invests the dural sac and is continued through the intervertebral foramina around the nerve-roots and ganglia. This external pachymeningitis is really a small-celled infiltration with hemorrhages or else there are fibrinous deposits or colloid infiltrations in disseminated plaques. The vessels are also pathologically altered and bleeding takes place by preference between the ganglia and anterior roots while the pachymeningitis is most marked about the roots, especially the seventh and eighth cervical, the lower lumbar and the upper sacral. Secondarily, an interstitial neuritis and gangliitis develops. The former affects only the extradural portion of both motor and sensory roots; the latter amounts to a proliferation of the intracapsular endothelial cells, with infiltration of round cells and karyolysis of the ganglion cells. The interstitial infiltration and the pachymeningitis itself are characteristic for tetany and the most severe cases have the most intense lesions. Concerning etiology, tetany is probably most often caused by measles, influenza and pneumonia but it is also possible that there is a specific micro-organism or that leucomaines and ptomaines liberated by auto-intoxication exert their injurious influence upon the nerve-roots. In conclusion, a new symptom of tetany is described: If the anode of a current of three or four milliampères is placed upon the chest, and the cathode upon the fifth, sixth or seventh cervical vertebra, rapid twitchings will occur in both upper extremities at each closure.

**Osmic Acid in Clinical Microscopy.**—The undoubted value of osmic acid in clinical microscopy has been repeatedly demonstrated, but has never been widely employed in general daily practice. C. Posner (Berl. klin. Woch., Aug. 10, 1903) calls attention to its use in quickly fixing the living cells of the body fluids, as a substitute for heat or other agents. For this purpose he employs the fumes which come from a few crystals of the acid placed in a dark colored bottle. The stopper of the latter is removed and the object carrier or slide is held over the open mouth for a few seconds, care being taken that the fumes are not inhaled. The preparations are then dried in the air and stained directly, washing or other preliminary measures being unnecessary. The method is very efficient for the examination of the blood but the author has applied it more particularly in the examination of urine. Pus from the urethra shows much more distinctly than with any other method, the intra- or extra-cellular location of the cocci, while the cells are not distorted and the nuclei are very distinct. Urethral shreds, which are ordinarily very difficult to demonstrate satisfactorily, are fixed and stained faultlessly and quickly. The same applies to the examination of prostatic secretion. The method seems to be particularly applicable to the demonstration of urinary sediments,—the outlines of the leucocytes are well preserved and the nuclei are uncommonly well stained. The red and epithelial cells, bacteria and even the crytals remain in their natural condition. It is also possible in many instances, to stain the casts, although the results frequently vary in a way which cannot at present be explained.

**Active Substances of the Colon Bacillus.**—Two principles could be isolated from the bouillon cultures of the colon bacillus by A. Carega (Centralbl. f. Bakt., Vol. 34, No. 4), one a nuclein and the other a nucleo-albumin. The nuclein is a toxic substance with cumulative action; the smallest fatal dose is two centigrams per kilogram body-weight. A specific agglutinating principle against this substance is not formed in the blood-serum. The nucleo-albumin is also toxic but not cumulative; the fatal dose here is six centigrams per kilogram and the blood-serum acquires a specific, agglutinating property. Upon analysis, the nucleo-albumin is found to consist of two substances, a toxophor principle, destroyed by heat, and an agglutinogenous, indifferent principle, not affected by heat. The toxophor group plays no part in the agglutination. It is impossible to immunize rabbits against the colon bacillus with the nucleo-albumin.

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## SATURDAY, SEPTEMBER 12, 1903.

### TREATMENT OF ANEURISM.

ONE year ago, Dr. Rudolph Matas, of New Orleans, announced a characteristically ingenious method, which he had devised and put into successful practice, in the treatment of operable aneurisms. Insufficient time has elapsed since the operation was first described to permit accumulation of the statistical data necessary to establish its general value, but that it has proven attractive and serviceable to American surgeons there is evidence.

The following is quoted from Brewer's recently published Manual of Surgery, "Rudolph Matas, recognizing the ready adhesion of sutured serous surfaces, advises after compression of the main supplying arterial trunk incision into the aneurismal tumor, removal of the clots and fibrin, and closure of the arterial orifices by sutures so placed as to ensure broad approximation of the margins of the openings. In sacculated aneurisms he closes the single orifice of communication between the artery and aneurismal sac, *and thus restores the main vessel.* In certain fusiform aneurisms he constructs a new channel by suturing the walls of the sac over a rubber catheter in the same manner as the Witzel method of gastrostomy is carried out. After all of these procedures he obliterates the remaining portion of the aneurismal cavity by closely approximating its walls by suture. He claims that this procedure is safer than the other methods: that the wound heals more promptly and that in some instances the artery is restored to its original dimensions."

A review of a masterly monograph on the operative treatment of aneurism, in the April number of the *Deutsche Zeitschrift für Chirurgie*, by Jacobsthal places one in accurate possession of the best manner of treatment, as determined by comparative statistics. In conclusion he says, "Extirpation is without doubt the ideal method. Unfortunately it is applicable only in chosen cases. If the aneurism is not thrombosed but, rather, thin walled and pulsating, extirpation can be advised only if the tumor is small and of slow growth. If extirpation is not possible the next best treatment is proximal ligation. If consolidation of the sac does not follow proximal ligation, distal ligation is indicated. In those cases where only distal ligation can be practised the prospect of a permanent cure is remote. In far advanced inoperable cases, Macewen's procedure of needling and scratching the aneurismal wall is indicated. Electrolysis and puncture by wire must not be forgotten, as Thorburn has recorded marked improvement in a case treated by the former technic. The value of gelatin injections is not yet definitely decided."

Although these conclusions do not differ from those advanced by most recent text-books on surgery, they are instructive in that they are based upon the usual firm foundation of German statistics. In a word, they show that the surgical treatment of aneurisms has remained very nearly stationary for a great many years. So much the more credit is due Matas for creating a technic which, although gaining recognition here, has not yet penetrated the self-sufficient conservatism of the continent. It is particularly unfortunate for completeness of Dr. Jacobsthal's article that Matas' contribution—the only one published in recent years which appears to mark a distinct advance—should have been wholly omitted from his full bibliographic citations of ninety-four papers referred to by the able author.

What the future holds in store for this operation is a problem that can be answered only by time. Naturally some difficulty might be anticipated in its application to those aneurisms in which, as unfortunately is often the case, extensive atheromatous or calcareous degeneration has taken place. The justice of this criticism, however, is denied by Matas.

It is earnestly hoped that all surgeons having

interest in the operative treatment of aneurisms will consider this technic so that by their conjoined opinions its worth and limitations may soon be definitely known.

### THE LIQUOR PROBLEM IN THE SCHOOLS.

A FACT that is not generally known even to many of those who are deeply interested in the various aspects of the liquor problem—social, ethical, economic, and physiological—is that there has been a Committee of Fifty investigating different phases of this important subject for nearly a decade.

As the result of their investigations a number of reports have been published; the first one of which, The Liquor Problem in Its Legislative Aspects, was given to the public in 1897. This was prepared under the direction of President Charles W. Eliot, of Harvard, President Seth Low, of Columbia, and Hon. James C. Carter, of the New York Bar, who make up the legislative subcommittee of the Committee of Fifty. In 1899 a Volume on Economic Aspects of the Liquor Problem was published as the report of the economic subcommittee, and in 1901 the ethical subcommittee, consisting of Professor Francis Peabody, Dr. Elgin R. L. Gould and Professor William M. Sloane, published Substitutes for the Saloon. The personnel of these subcommittees will serve to indicate how representative in its practical intellectual character is the constitution of the General Committee of Fifty. Physicians who are interested in the liquor problem then, and what physician is not, will feel it a duty not to miss the committees' reports.*

Just at the present time their interest can scarcely fail to be aroused by the report of the subcommittee which had in hand the investigation of the physiological aspects of the liquor problem. The directing members of this subcommittee are Professor W. O. Atwater, of Wesleyan University, Dr. John S. Billings, formerly of the Surgeon-General's Library, now of the New York Public Library; Professor H. P. Bowditch, Professor of Physiology at Harvard; Professor R. H. Chittenden, Director of the Sheffield Scientific School of Yale University, and Professor W. H. Welch, the Director of the Pathological Department of Johns Hopkins University. It is evident at once to anyone who is familiar with American Science that the investigations of such men are very likely to prove eminently helpful in the elucidation of this important problem, and as the treatment of the supposed physiology of alcohol has in the past almost, as a rule, been obscured by prejudice and partiality, it is very clear that this report can scarcely fail to be of very lively interest and far-reaching significance.

The first monograph in the collected report treats of physiological instruction, as it is at present attempted in the public schools. The subject is treated by Professors Bowditch, of Harvard, and Hodge, of Clarke University, Worcester, Mass. They are able to find very little that is favorable to say of present-day methods of teaching and of the approved text-books of physiology as far as regards their treatment of this subject. By a series of what the New York *Sun* used to call "deadly parallel columns" they show how the opinions of standard physiologies have been garbled, important portions omitted and only certain unfavorable passages selected in order to create that peculiar text-book—"The School Physiology"—that shall succeed in satisfying the requirements of the Women's Christian Temperance Union. Even Professor Hodge himself has been quoted to this effect, "Alcohol always lowers working power and in some degree interferes with growth." With reference to this purported quotation, Dr. Hodge is able to deny that it occurs in any of his public writings or elsewhere, so far as he knows. He has certainly not drawn any such sweeping conclusion from his own experiments.

This is only one example of the flagrant way in which scientific and educational confidence has been abused in the making of these text-books. It is no wonder, then, as the collation of the opinions of a number of teachers in many States makes clear, that these text-books do not appeal to them, and, in fact, to many seem rather calculated to produce an unfavorable rather than a favorable effect as regards the cause of temperance. One New York teacher has stated his conviction in the matter very forcibly, and as his opinion is that of many others who have considered the question seriously it seems worth while quoting. He says:

"The text-books are worse than useless. They defeat the very object for which the Women's Christian Temperance Union labors. They entirely suppress the few beneficial effects of alcohol and unduly exaggerate the evil effects. All youths pass through an age of unbelief, of cynicism, of agnosticism. This age generally comes during the latter part of the High School course. When

* Physiological Aspects of the Liquor Problem. 2 Vols. Houghton, Mifflin & Co., New York and Boston.

they learn from authoritative sources of the benefits of alcohol, the reaction is marked. They immediately question the truth of the evils of alcohol and term what the books teach 'a lie.' Such has been my experience."

The conclusion of the committee as to the teaching of the physiology of alcohol in the public schools is as follows:

"It does not seem to this subcommittee desirable to attempt to give systematic instruction to all children in the primary schools on the subject of the action of alcohol or of alcoholic drinks. To older children, and especially those in the high schools, it does seem proper that instruction should be given as to the principal facts known about the use and effects of alcoholic drinks, the sociological and especially the ethical relations of the subject, the means which have been tried to prevent the evils resulting from alcoholism—and the results,—the object being to enable them to form an intelligent opinion upon the whole subject, especially to distinguish between mere assertions and scientific evidence."

This conclusion would it, seems to us, appeal to all those who are seriously interested as regards the instruction of youth in the liquor problem. The question of the evil of alcohol is rather sociological and ethical than physiological. To attempt to put it on a purely physiological basis is to invite the inevitable reaction against pseudoscience and debase and besmirch the dignity of true teaching.

There are many other interesting articles in this report. Professor Chittenden, for instance, discusses the influence of alcohol and alcoholic beverages on digestion and secretion. Dr. John S. Billings treats of the relations of the drink habit to insanity and furnishes data relating to the use of alcoholic drinks among brain-workers in the United States. Professor Atwater has a long and very valuable article on the nutritive value of alcohol. Some of his conclusions have already been the subject of no little discussion in the daily press. A very interesting, though brief communication, is that by Professor Bowditch, on the use of temperance drinks. Not a few of the tonics that even the "unco guid" and temperate may use with perfect propriety contain notable percentages of alcohol. As Professor Bowditch puts it, "It is clear that very large quantities of drinks, containing a greater proportion of alcohol than the ordinary wines and beers, are consumed among the most rigorous of total abstinence circles and one of the foremost advocates of total abstinence has permitted her picture to be used as an advertisement of one of the most alcoholic of these drinks."

It is to be hoped that this report with its thorough treatment of so important a question as the liquor problem will meet with the attention it deserves, and that the result of it will be an improvement in the present methods of teaching physiology in public schools, and, above all, that the precious information thus given will serve to put an end to the present ill-directed educational crusade on the liquor problem, which is at least as likely to do as much harm as good and probably has actually been an incitement to the trial of things condemned so severely, yet so commonly used, under the eyes of pupils, since the inevitable impression was sure to be created that if people around them took the risks they did in the matter of alcoholic drinks it must surely be because there was some wonderful attraction and some alluring satisfaction in them.

## THE MUTTERINGS OF THE ZEITGEIST.

REMOTE, indeed, are the regions into which the keen knife and the keener eye of the abdominal surgeon have not pierced. He has wrested every subtle secret from the coy and retiring appendix; he has shown that the possession of the gall-bladder is a display of unnecessary organic wealth; with deft and fateful hand he has drawn aside the veil which guarded the mysteries of the pancreas from the outer world, and sought to invade the forbidden precincts of digestion itself.

So great and so rapid was this progress that at one time it seemed inevitable that the unfortunate followers of these men would be afflicted with surgical ennui; be cast, nilly-willy, into a sort of surgical nirvana. However, the fog has again settled over the operating table; again, like the apostle, "we see as through a glass—darkly."

This state of things has arisen from the efforts of a few surgeons to take from the internist the majority of the cases of gastric disease. If we are to believe the words of the surgical Zeitgeist, the only sufferers under the new régime will be the manufacturers of dyspeptic tablets. This "time spirit" proclaims a relief of all kinds of perplexing dyspepsia by some simple, speedy and innocuous intervention. If the toiling and weary practitioner greets the announcement that he no longer will be called upon to prescribe pepsin, pancreatin and charcoal, with pleasure, what lusty cries of joy will rise from the public throat when it hears of its emancipation! The average

man does not like to take ichthyol for a stomach-ache till he smells to his friends and tastes to himself like an unseaworthy mossbunker fishing craft. When once educated he will easily prefer a little rift in his belly wall through which the ache may be reached. His stomach, where pleasure and pain sit cheek by jowl, is to the layman the most important and precious organ of the body. It has been pretty clearly demonstrated that most of the so-called *dyspepsia* is simply the clinical evidence of some remediable variation from the normal position, contour or size of the stomach or its parts.

Save in the rarely diagnosed condition of early neoplastic growth the mainstay of the surgical relief for the majority of these cases lies in the establishment of permanent fistulous openings. This is true, whether the condition is an inoperable carcinoma of the pylorus or any one of the many so-called simple diseases of the stomach. It is therefore easy to appreciate the importance, as well as the growing need, of some form of technic which, from a surgical standpoint, will most fully meet the requirements. That this standpoint is a broad one and difficult of fulfilment is attested by the great number of methods which have been devised. A modification of one of the most ingenious is presented in this issue (See page 483). There may be in this work the germs of a technic which will have world-wide application.

## ECHOES AND NEWS.

### NEW YORK.

**Entertainment for the Insane.**—Dr. E. C. Dent, Superintendent of the Manhattan State Hospital on Ward's Island, deserves great credit for the Labor Day program he prepared for the recreation of the unfortunates under his care. A printed schedule of the events had been prepared in detail and the patients as well as visitors enjoyed the afternoon's sports in the fullest degree. Such diversions for the disordered minds effect more good than barrels of drugs.

**Examination of Imported Foodstuffs.**—Acting on the instruction of the Secretary of the Treasury, and at the request of the Department of Agriculture, the Collector of the Port of New York had sample packages of a number of shipments of foods, including preserved fruits and vegetables, taken from the Public Stores. These will be sent to Washington for examination by the experts of the Department of Agriculture. The consignees of the shipments will be asked to call at the Custom House and make statements as to the purity of the goods imported. These statements will be forwarded with the goods. The first instance of the Government's refusal to admit to this country adulterated wines, under the Pure Food Act, took place last Saturday when entry was refused of a shipment of white wine from Bordeaux, France. Upon analysis this wine was found to contain salicylic acid.

**Asepsis at the Soda Fountain.**—The movement by the Board of Health to enforce more perfect cleanliness in barber shops is wholly commendable and no objection has been met except among the most ignorant. The same authority might be advantageously exercised over the popular soda fountains and its utensils. In one of the largest retail drug stores in New York, where the sale of soda water is made a specialty, dirty glasses removed from the counter, were placed beneath a faucet of running water and shaken about for a few seconds and then refilled with soda water for the next customer. Even in one's own home, where the danger of infection is, to a certain extent, a known quantity, one insists upon having the glasses that are removed from the dinner table at least washed with soap and hot water. How much more should similar cleanliness be observed in a place frequented by the general public. The simple immersion of the glasses in an antiseptic solution, which should not be scarce in a drug store, for five minutes and subsequent rinsing with plain water would remove all danger and would assure the customer that he was getting nothing with his soda that he had not paid for.

### PHILADELPHIA.

**Philadelphia Hospital.**—Dr. Fred. S. Johnson has been elected to the position of Assistant Chief Resident Physician. Dr. Johnson is a former interne of the institution and takes the place made vacant some months ago by the resignation of Dr. G. E. Pfahler.

**Additional Means to Prevent Spread of Smallpox.**—Announcement is made by the Department of Public Health that hereafter all the inmates of a house in which smallpox appears shall be taken to the Municipal Hospital with the patient. After twenty-four hours, during which they have undergone a disinfecting process, they will be returned to their home which in the meantime will have been thoroughly disinfected.

**New Medical Society Formed.**—Physicians of the Cumberland Valley, including Franklin, Cumberland, and Adams counties of Pennsylvania, and Washington county, Maryland, met at Mount Alto Park September 8, and organized the Cumberland Valley Medical Society. The program of the meeting included papers on tuberculosis, organization, professional sociability, and hemorrhage in typhoid.

**Death of First Woman Physician.**—Dr. Emily R. Robbins, who is said to have been the first woman medical practitioner in this country, died in this city August 31 aged seventy-one years. Dr. Robbins was born in Philadelphia, of Quaker parents, and graduated in 1857. She practised for a time at Fort Madison, Iowa, afterward marrying a classmate. At the beginning of the Rebellion Dr. Robbins and her husband came to Philadelphia, where, during the war, she devoted most of her time to the wounded soldiers who were brought to the various hospitals here.

**Typhoid and Filtered Water.**—The number of cases of typhoid fever for the week ending September 5 was considerably less than during the preceding week. The greatest number of new cases, however, developed in two wards, the Twenty-first and the Twenty-second, which are supplied with filtered water. Some of the people who are opposed to filtration have declared that filtered water does not prevent typhoid fever. Filtration Bureau officials declare that these deductions are unfounded. They are positive that if all the drinking water of the city

was filtered, typhoid would disappear. They explain present conditions on the assumption that the patients drank polluted water elsewhere. Arguments against filtration, they say, should not be made until all the water consumed in the city is filtered.

**Elaborate Nurse-supply System Planned.**—The daily papers give an outline of an elaborate system of nursing projected by the Philadelphia School for Nurses. The movement is ostensibly in affiliation with the National Red Cross Society but appears to be really a scheme of the above mentioned school. Briefly, the plan includes an institution, probably an office building, near the center of the city which will be the home of at least 100 nurses; these nurses will answer calls not only within but outside the city, even to the remotest sections of Pennsylvania, New Jersey, Delaware, and Maryland; a rule of the house will be to ask no questions about fees, as none will be required; those who can afford may contribute to the expenses of the institution; the service is to include only those patients who are suffering from contagious diseases. This movement apparently has great possibilities but its prospective benefits to patients are greatly lessened by the nature of the training supplied by this institution. The course of training, we are informed, extends over a period of ten weeks only. In remote districts such nurses may be better than none at all, but on the whole it does not seem that the movement is calculated to add laurels to the nursing profession. This institution is graduating hundreds of nurses, so-called. Their short training may be of value in their own homes but it would seem an ill-advised movement that sends them broadcast over the country.

**Municipal Hospital.**—Dr. J. F. Schamberg has resigned the position of Assistant Physician. Dr. W. M. Welch has been retired as physician-in-charge and made consulting physician. Dr. Welch has been in charge of the hospital for a period of thirty-three years. During this time over 24,000 patients were admitted to the institution, 8,000 of which had smallpox. The greatest epidemic of that disease occured during the winter of 1871-'72, when nearly 2,400 smallpox patients were cared for at the hospital. During the thirty-three years not one nurse or physician contracted smallpox while attending to their duties in the institution.

## CHICAGO.

**New Medical College.**—The opening exercises of the Dearborn Medical College, a new evening medical school, were held Sept. 1. The opening address was delivered by Judge R. S. Tuthill. The initial enrollment comprised 175 students. The President of the College is Dr. L. Blake Baldwin; the Secretary, Dr. James H. Wells. The College building is that formerly occupied by the Bennett Medical College, and later by the Chicago College of Pharmacy. A clinical building is now being erected.

**Taxation of Medical Colleges.**—A decision has been rendered by the Board of Review to the effect that medical colleges operated for profit shall be taxed on their equipments. Rush Medical College was taken under advisement; Hahnemann Medical College was not taxed; Chicago Homeopathic Hospital was taxed on $4,000, and the American College of Medicine and Surgery, Bennett Medical College and Jenner Medical College on $2,000 each.

**Preparations for a Health Exhibit.**—Commissioner of Health Reynolds has returned to Chicago after a trip to New York and the seashore. He has begun to make preparations for the Health Department's exhibit at the St. Louis Exposition. The work of the department will be shown in a manner similar to that which won for Chicago the gold medals at the Paris and Buffalo expositions.

**Improved Quality of Milk.**—Now that the quality of the milk is becoming more satisfactory, the energies of the Milk Bureau are being concentrated on the proper handling of milk. Cleanliness and the sterilization of bottles and utensils will be insisted upon even more strenuously than quality. The milk scouts are doing good work in this direction. Many of them are physicians and appreciate the importance of sterilizing utensils used in the handling of milk. The small stores near public schools are being carefully inspected. Milk dealers are complaining that the stores are not sanitary and are demanding that the sale of milk from them should be suppressed. The sale of milk and cream in stores has increased immensely since the inadequate "one-delivery-a-day plan" has been in vogue.

**Diphtheria.**—The attention of the Chief Inspector of the Health Department having been attracted to the unusual number of reports of diphtheria cases in the south end of Cheltenham, a house to house canvass of the locality was made by Medical Inspector, Dr. H. M. Richter, who found a number of unreported cases: one fatal case in which the family had been told by the attending physician that the disease was croup and not contagious. At the funeral there was a large crowd, many being children. The funeral was the probable cause of three other cases; also a midwife recovering from diphtheria, said to have been attending cases of the disease in the neighborhood, and delivered a woman next door immediately after her premises had been disinfected. The facts in the cases of the falsely certifying physician and of the midwife will be presented to the State Board of Health at its next meeting. In other parts of the city there is only the usual number of diphtheria cases; scarlet fever, measles, whooping-cough and typhoid fever are either stationary or decreasing in prevalence.

## GENERAL.

**Trichinosis in Homburg.**—In Homburg, Germany, and its vicinity two hundred persons are suffering from trichinosis.

**William II. as Surgeon.**—A piece of tree-bark about 18 to 20 inches long has recently been placed in a glass case in the Hohenzollern Museum in Berlin, which bears this inscription: "Tree-bark with which His Majesty, the Emperor, improvised a temporary splint for the arm of Her Majesty, the Empress, at the time of her accident in the Grünewald, March 27, 1903."

**Another Medical Journal Passes Away.**—With the issue of the August number, the *Quarterly Medical Journal for Yorkshire* closes its existence. Founded in 1892 as the *Sheffield Medical Journal*, it soon enlarged its sphere of action and assumed its later title. "During the eleven years of publication it has been the aim," so states its obituary, "of those responsible for it to maintain a high standard of medical literature." The editorial staff returns thanks to the public, but no definite reason is stated for its discontinuance.

**Tuberculosis and Cigars.**—The investigations of Perserico in Italy have shown that the stumps of cigars smoked by tuberculous subjects and kept dry for a period of two to three weeks are capable of producing tuberculosis in guinea-pigs. As an important result of these findings, the Cuban authorities now require that, in all cigar factories, a sponge shall be used in finishing off the ends of cigars instead of their being moistened with the lips of the operator as formerly.

**Typhoid Epidemic at Metz.**—There is an epidemic of typhoid fever at Metz, due to bad water, and this is the occasion for shutting off the city supply. The irri-

tation of the local authorities is due to the despatch of the Emperor William to Prince Hohenlohe-Langenburg, the Viceroy of Alsace-Lorraine, in which the Kaiser says the state of affairs, which threatens the health of the garrison, is due solely to the city administration of Metz, "which is absolutely unable to decide what steps to take with regard to its water supply. Since the time of the Romans the mountain springs at Gorze have supplied Metz with its water. A water famine prevails in Metz, and the hotels are unable to satisfy their wants."

**Mont Blanc Place for Consumptives.**—Prominent French physicians are now turning their attention to Mont Blanc and the Mer de Glace as possible sites for consumptive sanatoriums. Dr. Kass, director of the Paris Municipal Sanatorium, took a number of pauper consumptives to the Mont Blanc Observatory this week to study the effects produced on them during the month. Dr. Bayeux, of the Saint-Lazare Infirmary, is carrying out similar investigations on the Mer de Glace and has expressed the opinion that the disease can be coped with and perhaps cured by proper treatment there.

**Pathology as Seen in Works of Art.**—Dr. Paul Richter, the recently-appointed professor of anatomy in the Paris Ecole des Beaux-Arts, was formerly an assistant of the eminent specialist in nervous disorders, Professor Charcot, at the Salpêtrière. For him he made a number of sketches demonstrating hysterical symptoms. While doing this work he was led to adopt the maxim that there can be no perfect beauty without perfect health. He noted pathological features in many well-known works of art, and concluded that faulty models were responsible. He accordingly advises his pupils to avoid the usual atelier models, and seek for the lines of human beauty among the acrobats in the circus, the blacksmiths, and the partially nude laborers at the docks and in the fields. "Beauty in action" is his motto.

**Longevity of Ministers.**—It is the universal testimony that clergymen reach the highest age, being close run by gardeners and vine dressers. Ordinary agricultural laborers, although their occupation is so largely in the open air, are not conspicuous as long livers, except in France, Sweden, and England. People working with wood are longer lived than those whose occupations are with metals, and both attain a higher age than textile workers and workers in chemical industries. The shortest lived people are miners, except in England, where the superior mining regulations and admirable sanitary arrangements have a beneficial effect. In England and Norway sailors and fishermen live to a far greater age than in Germany and France.

**The Bacillus in War.**—The Macedonian revolutionists, it is reported, threaten, in case they cannot bring about a war between Turkey and Bulgaria, or induce European intervention, to decimate the populations of the Macedonian cities controlled by the Turks by poisoning the wells with the bacilli of the plague. This is really a formidable threat, easy of execution, terrible in its consequences, and picturesquely barbarous. The plague bacilli can be put up in soluble capsules of small size, and might be dropped into wells without attracting any attention. From the point of view of the advantage of the human race it is not certain that the depopulation of this part of the world by pathogenic bacteria would be an unmixed misfortune, but this consideration in no wise mitigates the fiendishness of the crime of planting the seeds of a subtle and uncontrollable infection in soil where it would linger for years, with almost inevitably fatal consequences to all.

**Alarming Increase of Lunacy.**—Dr. A. B. Hays, superintendent of the Louisiana State Insane Asylum at Jackson, La., believes in adopting the radical measures to prevent insanity and points out that unless this be done the burden of caring for the insane will soon be too heavy for the sane to bear. In Louisiana insanity is increasing at the rate of more than 10 per cent. a year, or five times as fast as the population. When he took charge of the State asylum in 1896 there were 850 insane persons; there are now 1,550, an increase of 80 per cent. in seven years, while the population has grown only 15 per cent. Dr. Hays is in favor of radical legislation. He thinks the Louisiana legislature did well at the last session in prohibiting consanguineous marriage, to which he attributes a great deal of the insanity of to-day. The legislation against the sale of cocaine was also a move in the right direction, he thinks, and especially to the benefit of the negro race, who, under the influence of the drug, are driven mad by hundreds. The exhilarating or soothing effects of cocaine have brought other drugs into use among the negroes. Morphine, digitalis and half a dozen other poisons are slowly creeping into favor with them.

**Deterioration in British Lower Classes.**—The English Government has appointed a commission to inquire into the alleged physical deterioration of the lower classes in the United Kingdom. The clerk of the Privy Council is chairman, assisted by the former head of the Army Gymnastic School, the inspector of reformatories, the chief of the Navy Recruiting Service, statisticians, and others. The subject was brought up in the House of Commons by Sir William R. Anson, Parliamentary Secretary to the Board of Education, who declared that 60,000 children now attending London schools were physically unfit for instruction. The Director-General of the Army Medical Service reports that one man in every three offered as recruits had to be rejected. The appointment of the commission is hailed with approval. The *Daily Chronicle* says: "If the people as a whole are deteriorating, we must change our ways or give up the national struggle as a mistake. The creation and preservation of a fine stock of mankind is the first, perhaps the only reason for national existence, and if the mass of the people is going down hill in physique we may be quite sure it is going down hill in character and intellect as well."

**"Cuban Plague."**—During the past week much publicity has been given to a spurious report that a severe epidemic of yellow fever or some equally fatal infection had broken out in eastern Cuba and that its presence was being denied for political or commercial reasons. Unfortunately several of the more reliable representatives of the daily press gave prominence to the subject. The following denials from the Marine Hospital Service and from Dr. Guiteras make it certain that there is no yellow fever and suggest the inference that a few deaths from pernicious malaria have given the only foundation for the scare. Dr. Walter Wyman, of the Marine Hospital Service, which is maintaining a vigilant surveillance of the health of Cuba, states that no advices have been received from his agents diagnosing any sickness whatsoever as yellow fever. This statement is supported by a despatch from Minister Squiers at Havana, who says that the island has a clean bill of health so far as that dreaded scourge is concerned. His exact words are: "The whole island is free from smallpox and yellow fever." He adds: "In many of the provinces the death-rate has been abnormally low, owing to the improved methods of sanitation." Dr. Guiteras, who went to the Province of Santiago to investigate the rumors of plague there, telegraphs that there is no yellow or black fever or other epidemic at Santiago or Daiquiri. At Daiquiri there are some serious cases of malarial fever.

**Child Labor in New Jersey.**—On September 1, the new law concerning child labor in this State took

effect. It provides that no boy or girl under fourteen years of age shall be permitted to labor in any factory or workshop in any capacity whatsoever. The age limit is thus raised two years, the former act making it twelve years for boys and fourteen for girls. Last winter the legislature passed an act placing in the hands of Governor Murphy authority to enforce the law. The Governor has taken a decided stand in his public messages and speeches, and it is to be hoped that the present effort will be attended with success. At any rate it will give the public an idea as to the value of promises on the part of State authorities. The glass blowers of South Jersey, among whom child labor is at a premium, have threatened to contest the constitutionality of the new law, because of a silly provision in the act that it should take effect on September 1, without specifying whether it should be this September or some other September. While the failure to prescribe a definite date was either a stupid blunder of the legislature or a deliberate attempt to palm off an act that would not hold water, the department has been advised by the Attorney-General, it is understood, that the omission will in nowise affect the validity of the act. At any rate, the department has asserted its intention to insist upon compliance with the law and to prosecute all manufacturers who employ children under the prescribed ages. Since the technical objections to the act do not go to the merits of the measure, the factory inspector has taken the stand that all offenders should be prosecuted to the full extent of the law and this he says he is prepared to do.

**Leper Colony in Porto Rico.**—A bad state of affairs has been discovered on Cabras Island, on which the leper colony of Porto Rnco is located, at the entrance to San Juan harbor. As a result the Executive Council of Porto Rico recently held a special session, by request of Acting Governor Hartzell, and has ordered a thorough investigation. It has been believed, until this discovery, that the leper colony has been conducted in a manner most creditable to all concerned. The insular government has been expending about $10,000 a year for its maintenance. Dr. Goenaga, acting director, found dogs, goats, chickens, rabbits, and pigs herded with the lepers, the chickens nesting in the unclean beds. The patients were in a filthy condition, with no bathing facilities and most of them clad in rags. The food supplies stood about exposed to corruption. In these surroundings he found two "patients," one an old man, and the other younger, who were not afflicted with leprosy. The old man was committed years ago as a leper, thus being consigned to slow and awful death, and the younger man was sent to the colony later. These men will be removed this week and especially quarantined in a building now being constructed, for a sufficient time to make their release safe. There are now in the Cabras Island colony twenty-three lepers, and at least as many more, it is believed, are scattered through Porto Rico. The Superior Board of Health, within whose province is the determination of this disease, has had many difficulties to contend with in its endeavor to deliver to the colony the balance of those afflicted and at large on the island. One of the difficulties is that of transportation after discovery, the common carriers absolutely refusing to bring the lepers from the surrounding country. The board is now trying to solve the problem by arranging for special oxcart transportation at government expense. It is hoped that within a year all the lepers of Porto Rico will be segregated at the colony.

**Obituary.**—Dr. James Hibbard, aged eighty-seven, died in Richmond, Ind., September 8. He was an ex-President of the American Medical Association.

Report of the death at Harrenalb, in the Black Forest of Würtemberg, Germany, of Dr. Joseph Schnetter, one of the founders of the German Hospital and Dispensary of New York, and for forty years an active practising physician in this city, has just reached his friends in New York through his late residence in the city of Karlsruhe, Germany. He was eighty-two years of age. Dr. Schnetter was born at Gerolzhoven, Bavaria, and was graduated from the University at Würtemberg. Jealousies on the part of his fellow-students caused him to leave the university, where he was offered a professorship, and to come to America in 1849. He settled in New York. He became connected with many charitable institutions, among them being the German Hospital and Dispensary. In 1889 illness caused him to give up his practice.

Dr. Henry De Haven Cameron, late surgeon of Troop C, N.G.N.Y., died in Pony, Mont., on Friday, after a long illness. He was born in Brooklyn thirty-seven years ago and was a graduate of the New York College of Physicians and Surgeons. For a time he was an interne in the New York and Chambers Street hospitals, and later served two years in the Methodist Episcopal Hospital in Brooklyn, when he became well known professionally even before he commenced private practice. He was one of the organizers of Troop C in 1890, and was first appointed assistant surgeon, in which capacity he served several years. He returned from India, where he was traveling, at the outbreak of the Spanish war, and served with his troop through the Porto Rico campaign. When the troop was mustered out he was promoted to the rank of surgeon which he held to the time of his death. As a mark of appreciation of his services, he was presented with a sword and full riding outfit by the officers and privates of his troop. He was well known in Brooklyn and New York in the National Guard and in the medical profession. He was for years identified with the Methodist Episcopal and Norwegian hospitals. Owing to ill health, he was compelled to go to the far West, from which he returned improved, but still suffering from the conditions that finally caused his death.

Dr. Luis P. Walton, of New York, died suddenly September 8 at the Bath Club, in London. He had been swimming and on coming out of the water complained of feeling ill, and lay down to rest a while. He died within an hour of heart disease. Dr. Walton was a son of Dr. Henry C. Walton, an English practitioner, who came to New York in 1850. Dr. Walton was born in Liverpool just previous to the time of his father's removal to this country. He studied in the schools of New York, and, taking the medical course at the College of Physicians and Surgeons, was graduated in 1870. He spent several years in the college dispensary, and then began general practice, in which he was very successful.

## CORRESPONDENCE.

### BOTHRIOCEPHALUS LATUS.

THE following letter was forwarded to the MEDICAL NEWS by Dr. Berkeley, and is of interest in connection with his paper published in our issue of August 1.—[ED.

W. N. BERKELEY, M.D.:

DEAR DOCTOR—In answer to the request in your favor of August 23, I have obtained the following facts from

the patient and my own memory and books, in relation to the case of *Bothriocephalus latus* spoken of in my letter.

Nearly nine years ago (Sept. 4, 1894) the mother of the young lady who suffered with it came to my office, bringing some segments of the worm to ascertain what they were, stating that her daughter had passed them with her feces. Upon examination, I told her they were from a tapeworm, and that I would see the patient taking proper medicine and instructing her how to use it. A few days after I did so, and found she had passed other segments, which I saw and noticed that they were endowed with motion similar to the movements of the measuring worm. She stated that she had been passing them for about a week. She complained in no way except from an irritability of the nervous system, and after knowing her condition, with intense disgust at the idea rather than discomfort from it. A few days thereafter her mother brought to the office the whole worm with head, which had been passed by her, and which I still have. It was, I think, about 19 feet long (have not taken it from the bottle to measure now, for fear of damaging it). Segments very narrow and short, being about five-eighths of an inch long and one-half of an inch wide, then tapering in width to one-fourth of an inch, still being five-eighths of an inch long; the openings being all along the same side. I had administered pelletierine, with castor oil following, of course restricting diet. The patient does not have the least idea where she obtained it. Was in Europe several years before, and a tour to Egypt and Holy Land was taken several years after she passed it. She cannot tell how long she was afflicted with it, but I do not suppose she obtained it in Europe, being so long before she passed any segments.

I find there is a constriction of two or three segments in one portion of the worm, they assuming the form of those near the terminal end, and again becoming wider, assuming the shape previous to the constriction.

Horace M. Bellows, M.D.

Huntington Valley, Pa., Aug. 29, 1903.

## OUR LONDON LETTER.

(From Our Special Correspondent.)

London, August 29.

THE DULL SEASON—DEATH OF A PROMINENT SANITARIAN—THE "SWEDISH CURE."

We are at the height, or rather the depth, of the dull season, and in the Temples of Medical Science in Harley street and Grosvenor Square the oracles are dumb, or are replaced by understudies. This is the time when the young Lazarus of medicine picks up the crumbs that fall from the rich man's table. But everyone else is away; the medical schools are in recess, and silence reigns in the debating rooms of the Societies. The medical world should therefore be happy, for at present it has no history.

There is, however, one most experienced operator, not strictly belonging to the profession, though very intimately associated therewith, who never takes a holiday. In season and out of season he is at work, for, as Robert Burns says,

> Folks maun do something for their bread
> And sae maun Death.

He has just struck down one of our leading sanitarians in the person of Professor W. H. Corfield, of University College, London. After a brilliant career at Oxford he studied medicine in London and on the Continent. Early in the seventies he was appointed professor of hygiene in University College, being the first holder of such an appointment in London. To him, too, the first laboratory of hygiene founded in London, that at University College, mainly owes its existence. He took a leading part in organizing the International Congress of Hygiene and Demography held here in 1891. He was a member of many foreign scientific societies, and was the author of several books dealing with matters within his special province. Among them may be mentioned a *Résumé of the History of Hygiene; Dwelling Houses: Their Sanitary Construction and Arrangement; Disease and Defective House Sanitation* (which was translated into French, Italian and Hungarian); and *The Etiology of Typhoid Fever and Its Prevention.* Two or three years ago he was appointed sanitary adviser to His Majesty's Office of Works. He had also a very lucrative practice as a consulting sanitary expert. He was an eager collector of old books, though he seemed, like most bibliomaniacs, to care more for the rarity and especially the bindings of his books, than for their literary quality. Still, he did know something of the contents of his treasures. He had a remarkable collection of woodcuts of Thomas Bewick, and a considerable number of choice prints. The story of his last illness presents some remarkable features. Two or three years ago he lost appetite and digestion; his frame, always small and spare, wasted to a degree recalling Falstaff's description of Justice Shallow ("I do remember him at Clement's Inn, like a man made after supper of a cheese paring"); his face had an earthy look—in short, he had all the appearance of a man suffering from advanced malignant disease. The seat of the pain and other symptoms suggested cancer of the stomach. All his friends thought he was dying. Suddenly a startling change took place. He was able to eat beefsteak without discomfort; his shrunken form filled out and his face recovered the ruddiness of health. He attributed his cure—for such it seemed to be—to a peculiar form of Swedish treatment consisting, as far as I could make out, in manipulations directed to stimulate the nerve ends over the area of discomfort. He was enthusiastic about the treatment, and must have been an excellent advertisement for the healer who had wrought such a wonder in him. But, alas! the vanity of human things is as strikingly exemplified in quackery which has faith on its side as in orthodox medicine which leans on the broken reed of reason. It became painfully clear that the apparent "Cure" was but a temporary response to stimulation. Corfield did not, however, lose faith in vibration massage. Hope springs eternal in the human breast and he went to Sweden in order, I suppose, that he might get the treatment at the fountain head. He was looking about for some other shrine of healing when death brought his quest to a sudden end. He had not completed his sixtieth year.

The "Swedish treatment" is very fashionable here at present, and many professors of the art are earning incomes that make even successful physicians green with envy. The profession in this country, which is fanatically conservative, has always looked more or less askance at massage, and as far as the general body is concerned, it is only now beginning to realize that it has any value. Hence it comes about that this method of treatment is to a large extent in the hands of quacks, and is therefore looked upon by sticklers for professional purity as an unclean thing. This is regrettable from every point of view. There is much, as Dr. Wharton Hood has shown, to be learned from bone-setters, and the same may be said of the Swedish manipulators, *Fas est et ab hoste doceri.* The profession should imitate the example of Molière and take what rightfully belongs to it wherever it may be found. The doctors will be driven before long to recognize the logic of facts, but by that time their chance of captur-

ing the treatment and giving it the consecration of orthodoxy will be well-nigh gone. Already some of the leaders of the profession meet bonesetters and Swedish curers on the sly. They would of course say that they superintend the treatment, but the fact is that in the alternative presented to them of losing their patients or meeting the illegitimate practitioner, they prefer the latter course. The fashionable quacks are in a position to dictate their terms. One noted "Professor" who requires a dozen "operating rooms" and a large staff of assistants to meet the exigencies of his practice, has among his patients the very flower of English society, including the Royal family. It may be said that these people, being silly, are the natural prey of quacks, but among the clients of the masseur and the bonesetter are judges, generals, ecclesiastical dignitaries—in a word, the heads of every profession but the medical. And, as has been seen, even the bigwigs of medicine, like Professor Corfield, when in the grip of *ineluctabile fatum*, seek help from quackery.

## SOCIETY PROCEEDINGS.

### BRITISH MEDICAL ASSOCIATION.

*Seventy-first Annual Meeting, Held in Swansea, July 28, 29, 30 and 31, 1903.*

(Continued from Page 432.)

**Pathology and Treatment of Chorea.**—Dr. D. B. Lees said: "Our subject to-day is the pathology and treatment of that common disease of childhood which is so inadequately and incorrectly described by the name 'Chorea.' Inadequately, for there is much more than abnormal muscular movement in this malady. Incorrectly, for whatever else a choreic patient may do, there is a total absence of any rhythmic movement which might fairly be described as 'dancing.' It is most unfortunate that the name should wholly misrepresent the disease. Perhaps, when the pathology is completely understood, a better name may be invented. Meantime let us define our subject by excluding all varieties of hysteria, all forms of habit-spasm, and all irregularities of movement resulting from gross cerebral lesions, such as athetosis and 'post-hemiplegic chorea.' And in this section we neglect the rarer chorea of adults and of old age, and concern ourselves only with the so-called 'chorea' of childhood.

"The most obvious fact in chorea is disorderly muscular movement, spasmodic, clonic, irregular, involuntary, with imperfect control and coordination. If we observe carefully the distribution of these involuntary movements, we find that it is precisely the muscles over which we have most voluntary power that are most affected in chorea—the muscles of the face, those of the tongue, and those of the hands and arms. These are the muscles which specially express emotion—by grimace, speech, and the movements of the hands and arms which naturally accompany eloquent or excited speech, especially in the more emotional races. It is precisely these muscles which are most affected in chorea: the face, tongue, and hands are much more implicated than the proximal parts of the upper limbs, the upper limbs more than the lower, and the lower limbs more than the muscles of the trunk.

"Respiration, over which we have a real though limited control, is affected much more than the action of the heart, over which we have no voluntary power whatever. The heart's action may, indeed, be irregular in chorea, but it is much less so than the respiration, and the heart often works steadily enough while the breathing is quite irregular. Choreic movements are often more pronounced on one side of the body than on the other, and in slight cases they may be limited to the limbs of one side. Choreic movements cease when the patient falls asleep, and recur when he wakes.

"These facts, taken together, indicate unmistakably a disorder of the brain, and specially of the motor centers. In the Rolandic area of the cortex much space is allotted to the movements which are specially under voluntary direction and control—to the face, hand, and arm—less to the lower limbs in proportion to their size, and comparatively little to the muscles of the back and of the abdomen. The relative affection of the different muscular movements in chorea corresponds to the cortex arrangement.

"It is clear that in chorea these centers are in an abnormally excited state, for if you ask a choreic child a question, its hands will often reply before its month. Place the child at rest, with its arms and hands outstretched on the bed, and wait for a quiet interval when the choreic movements have ceased, or are at all events much diminished. Then ask the child a question, however simple, its name, or the number and names of its brothers and sisters. Usually the choreic movements recur at once in the hands, often before the reply is uttered, or if they have not previously ceased, they become very rapidly much more violent. It seems that the outgoing impulse to the speech center finds the adjoining centres of the motor area abnormally excitable, and overflows into them. Sometimes the choreic movements follow so quickly after the question that it almost seems as if the ingoing auditory impulse had reached them directly.

"Similarly, if the child squeezes an object firmly with one hand the other hand usually becomes more decidedly choreic. In a case of hemichorea, a strong squeeze with the unaffected hand brings out additional movements in the choreic hand, while a squeeze with the affected hand produces little or no effect on the other. This seems to indicate clearly that the hand center in the cortex on the one side is more excitable than that on the other.

"The motor centers are not only irritable, they are also weak. This weakness may be obvious from the first, but it is apt to become greater as the irritability subsides. The grasp is feeble, and the weakness of the whole upper limb may be so great as to deserve the name of paresis. When the hands and arms are outstretched, the child standing or sitting, there is usually a slight flexion of the wrist, apparently due to loss of tone of the special extensors, and the voluntary extensor effort of he common extensor of the fingers slightly overextends the first phalanges. It may be impossible for the patient to walk, to stand, to rise from the recumbent position, almost impossible even for him to lift one leg over the other.

"It is clear that in chorea much more than the Rolandic area of the cortex is affected, and it is probable that the whole brain suffers more or less. Is the cord affected also? If so, its affection is overshadowed by that of the brain, as in tuberculous meningitis. But one phenomenon is observed which may indicate an extra irritability of the spinal ganglion cells—an increase in the briskness of the knee-jerks and a tendency to a prolonged extension of the knee when the patellar tendon is struck. Possibly also the atonic condition of the wrist extensors may be of spinal origin.

"Are the peripheral nerves affected? Choreic children sometimes complain of flying pains in the limbs, away from the joints, which may possibly be neuritic. In some cases of chorea the knee-jerks cannot be obtained, though it is not certain that this is really a symptom of the disease, or how, if a symptom, it is produced. And the occasional occurrence of slight optic neuritis, mentioned by Sir William Gowers, must

also be remembered. It may be added that choreic children often suffer from constipation; the cause of this is uncertain.

"In chorea, then, there seems to be a disorder of the whole cerebral cortex, probably of the whole brain, possibly of the nervous system in general, sufficient to produce very definite symptoms, and often lasting for a long time. Yet the disorder is not a destructive one; it usually ends in complete recovery. The pathological changes are, therefore, if organic, of slight intensity, and it seems probable that the morbid state may be largely due to a toxemia. Yet the fact that the symptoms may be very definitely localized suggests that the cause cannot be simply a toxemia; there must be something focal as well. The changes found post mortem in the brains of the few cases which end fatally have been mainly confined to the vascular system—hyperemia, dilatation of vessels, perivascular leucocytes, thromboses, and slight hemorrhages. Alterations in the nerve cells have also been found by several observers. A recent investigation of two fatal cases by modern histological methods by Dr. Reichardt, of Chemnitz, showed small hemorrhages, irregularly scattered, with collections of leucocytes, chiefly mononuclear, and dilatation of vessels, with perivascular small-celled infiltration, in many parts of the brain, in varying amount. No changes were detected in the ganglion cells, but there were areas of fatty degeneration of nerve fibers; in the spinal cord the parts most affected were the root fibers and the anterior and lateral horns, and the posterior columns—the anterior and lateral tracts were free. Cultures from the fluid of the cerebral ventricles of the first case gave no result, but '*Staphylococcus aureus*' was obtained from the heart blood. In the second case there were '*Streptococci*' in the cardiac valves, and a few colonies of '*Staphylococcus albus*' were obtained from the brain.

"If we look for clinical evidence of a morbid blood-state in chorea, we find that it is frequently accompanied by manifestations of the toxemia which we call 'rheumatism.' Any of the ordinary rheumatic phenomena in a child may accompany chorea—tonsillitis, arthritis, erythema, nodules, cardiac dilatation, endocarditis, pericarditis, pleurisy. The most frequent of these is cardiac dilatation, for in chorea, as in rheumatism, the left ventricle is almost always too large, the left border of the heart extending beyond the left nipple line, often as much as one fingerbreadth, and the first sound being feeble. The next commonest is a systolic apex murmur; whether this is always due to valvulitis is uncertain, but in many cases it is so undoubtedly. In almost all fatal cases of chorea recent vegetations are found on the mitral valve. A fairly frequent evidence of rheumatism is the rheumatic nodule, single or multiple. The neighborhood of the various joints, also the tendons of the hands and feet, the occiput, and the vertebral spinous processes ought to be carefully examined for nodules in all cases of chorea. The other manifestations of rheumatism must also be borne in mind, and special care should be taken not to overlook a pericardial rub.

"I draw special attention to the fact that chorea is often the first of a series of rheumatic attacks. If this be ignored, and the relationship of the two diseases be based simply on the precedence of rheumatism, the connection of the two will inevitably be understated. It occurred to me that it would be worth while to investigate carefully the amount of subsequent rheumatism occurring within a few years after an attack of chorea in children who had had no rheumatism previously. Dr. Batten was good enough to investigate this point in the out-patient department of the Hospital for Sick Children."

"He found in 115 cases of chorea that whereas the percentage of previous rheumatism was stated to be only 32.2 per cent., three years later so many of them had subsequently suffered from rheumatism that the percentage rose to 43.5, and three years later still it had risen to 53.2, so that the lapse of six years had increased the percentage by 21 per cent. And this is below the truth, for after the lapse of six years as many as 38 of the 115 children could not be investigated. If the same proportion of these missing ones had become rheumatic, the percentage would be increased, not by 21, but by 28 per cent. This added to the cases of 'previous' rheumatism would give a total percentage of 60 per cent.

"The clinical evidence is in reality very strong, and we turn with interest to the excellent work of Drs. Poynton and Paine on the bacteriology of rheumatism to learn whether they can throw light on the pathology of chorea. I need not remind you that these observers, by a series of investigations, have isolated from the tissues in cases of fatal rheumatism, and also from the blood of rheumatic patients during life, a diplococcus which they have been able to cultivate, and which when injected intravenously into rabbits, has produced in them all the symptoms of a violent rheumatism in a child, and that a recent subcutaneous rheumatic nodule, excised with aseptic precautions two hours after death, at once immersed in a suitable medium and cultivated for forty-eight hours in an incubator, was found to contain an exuberant growth of this organism without the presence of any other. In my judgment these results are decisive.

"Accepting then the fact as now demonstrated that rheumatism is a disease caused by a diplococcus, and remembering its close clinical connection with chorea, we ask with interest whether this diplococcus is also responsible for the production of chorea. The evidence on this point is as yet scanty, but it is extremely suggestive. One of the rabbits injected with a culture of this diplococcus obtained by incubating pericardial fluid from a fatal case of rheumatism, developed symptoms remarkably resembling chorea in a child—clonic irregular involuntary spasmodic muscular movements, especially of the forelimbs and of the face, with a condition of 'nervousness' such that it started at any sudden noise. This rabbit was killed, and diplococci were found in the lymphatic sheath of the vessels in the pia mater and in the endothelial cells of the blood capillaries penetrating the cortex of the brain.

"A second fact is this. Dr. Poynton cut sections of the brain of a fatal case of chorea which had been preserved for three years, and found diplococci in the cortex itself, also in profusion in the mitral valve. These, however, were not cultivated, so that it is not proved that these were the rheumatic diplococci. Yet if we take these two facts together, and remember that Dana, Apert, Wassermann, and others have isolated a diplococcus from the brain in fatal cases of chorea, it becomes more than probable that before long the demonstration will be made complete. Fatal cases of chorea are happily uncommon, and it will require some time before the point can be proved.

"But if it has been shown that these diplococci are almost always found in the heart in fatal cases of rheumatism, and if they have actually been found in the blood during life, it seems certain that they must often reach the cerebral circulation. If their presence in the pial vessels and the cortex is the cause of chorea, we must look upon this disease as a microbic invasion of the brain, as in tuberculous meningitis. Why the result is so different in these two diseases must depend upon a difference in the virulence of the microbe, and the different measure of resistance on the part of

the phagocytes and other defensive mechanisms. In this respect some recent observations by Drs. Poynton and Paine are of interest. They found that in the arthritis of rheumatism the fluid effusion is usually sterile; that the diplococci are present in the synovial membrane of the inflamed rheumatic joint, but that they are there seized upon by the phagocytic cells, and that the diplococci contained in these cells are so much devitalized that they can no longer be cultivated.

"Why the rheumatic diplococci should cause chorea in children and not in adults; why some rheumatic children should become choreic and others not: and why girls should be choreic three times as frequently as boys, must depend upon differences of individual power of resistance.

"Are we then to say that chorea is 'cerebral rheumatism?' Yes, if we add 'in the great majority of cases.' But we must not make the statement absolutely, for other microbes and other toxins may perhaps affect the cortical cells in the same way as the rheumatic diplococci and their toxin, just as the *Bacillus coli* and the *Bacillus enteritidis* of Gärtner may produce a continued fever resembling that caused by the typhoid bacillus; and, to say nothing of 'senile chorea,' the disease known as Huntington's chorea is found to be caused by multiple organic sclerotic changes in the cortex. It is even possible that the sudden emotional disturbance caused by fright may in some way disturb the nutrition of the cortical cells in a susceptible brain in a way similar to the altered nutrition caused by the rheumatic toxin. Sir William Gowers reminds us that throughout the animal kingdom the emotion of alarm has a direct effect on the motor centres essential to the safety of the animal alarmed. Cases of chorea really caused by fright in the absence of rheumatism are rare, but they probably exist; the difficulty is to prove the absence of rheumatism.

"I desire then to maintain that every case of chorea, however mild, ought to be looked upon as presumably rheumatic. And when we remember the danger of untreated rheumatism in a child, and the heart disease which it so frequently causes, we see how great an injury one may do to a child by neglecting a slight chorea. Many a mitral stenosis in later life, with its distressful years and its premature death, might have been averted if the practitioner who attended the case of slight chorea in childhood had treated it vigorously as rheumatic.

"If, then, in the majority of cases chorea means a brain infected with rheumatic diplococci, surely the treatment which cures rheumatism ought to cure chorea. Yet it is not the general experience that much has been effected in this way. May not this be because the doses given have been too small? If one wishes to cure a cerebral syphilis, large doses of iodide must be employed. Acting on this idea, I have lately given to cases of acute chorea large and frequent doses of sodium salicylate, to which invariably has been added twice the amount of sodium bicarbonate. This addition of alkali I think of great importance, from more than one point of view. In a considerable number of cases this treatment has produced a very rapid improvement. The plan is certainly deserving of further trial in acute chorea. Success seems to depend upon the amount given daily, a further improvement sometimes following each increase of the dose. That the improvement is not due merely to the rest in bed, nursing, and feeding has been proved in some cases by allowing three or four days to elapse before administering medicine. Some cases grow worse if left untreated, others improve slightly.

"The dose of sodium salicylate for a child of six to ten years should be at first 10 gr., with 20 gr. of sodium bicarbonate. After two or three days the quantities should be increased to 15 gr. and 30 gr., respectively. After two or three days more they may, if necessary, be increased to 20 gr. to 40 gr. These doses should be given every two hours during the day, and every three hours during the night, ten doses in the twenty-four hours. Thus the total amount of salicylate given at first is 100 gr. daily, increased to 150 gr., and finally to 200 gr.

"A careful watch must, of course, be kept for any symptoms of salicylate poisoning, and especially for a peculiar deep inspiration simulating the 'air-hunger' of diabetes. If this occurs the medicine must be immediately given up, for it is a sign of danger. It is, however, a rare phenomenon. There is some reason for thinking that it is really an acid poisoning. The similar 'air-hunger' of commencing diabetic coma may sometimes be arrested by large and frequent doses of alkalies, and the only fatal case of salicylic air-hunger that has come under my own observation had taken the salicylate without any additional alkali. Air-hunger began to show itself in one case which I treated with aspirin, instead of salicylate, without alkalies, and disappeared when the drug was omitted. It seems to me very important that each dose of salicylate should be accompanied by twice as much bicarbonate.

"The unpleasant symptoms sometimes caused by salicylates in adults, the deafness and noises in the ears, the headache, the mental symptoms and delirium, are exceedingly rare in childhood. Occasionally vomiting is troublesome, but it may usually be overcome by suspending the treatment for a few hours and then beginning again with a smaller dose, which should be gradually increased. Pulse failure occurring during the employment of salicylates, both in children and in adults, is generally not due to the remedy, but is caused by an acute rheumatic dilatation of the left ventricle—a common, but usually overlooked, phenomenon in rheumatism. Careful observation of the position of the border of the left ventricle, as ascertained by accurate light percussion, should be made daily. As to any general 'depression' from the salicylate, in children it is usually quite absent; indeed, it has been remarkable how much brighter and more lively the patients have become during the treatment. It should be added that the large doses of bicarbonate do not impair appetite or disturb digestion in rheumatic children, and that, in spite of them, the urine often remains acid for a considerable time. Albuminuria is not caused by the treatment above advised.

"Every choreic child should, I think, be kept for a time completely at rest in bed, however mild the chorea may be. If there is much tendency to excitement, restlessness, or emotional attacks, complete isolation is very helpful. A cot with padded sides is necessary in severe cases, and the most careful and efficient nursing is essential. It may be needful to give in such cases hypnotic drugs, as chloralamide, chloral, or bromide, the first night or two, to secure sleep, but in many cases these can be avoided if large doses of salicylate and bicarbonate are used. The diet at first should be of milk only."

**Salicylates in Chorea.**—Dr. Henry Ashby said: "I agree with Dr. Lees that the rheumatic toxin is the most important factor in the production of chorea, but I am not inclined to the belief that all cases of chorea are rheumatic. Chorea is exceedingly common in overgrown, anemic girls in whom there is no evidence of rheumatism or of heart disease, and I do not think that in this class of cases salicylates are of much use. The bacteriological evidence is most important and ultimately the question of the rheumatic origin of all cases of chorea will be finally settled by this means. The observations of Dr. Lees on the treatment of chorea by large doses of salicylates are very important. I confess I am some-

what frightened of such doses as he recommends. I am inclined to think that more moderate doses of some 40 to 60 gr. daily are likely to do all the larger doses will, and with less risk. Antipyrin in moderate doses is certainly useful in acute cases. Arsenic is of doubtful value and in large doses almost certainly harmful. After all, rest in bed and careful dieting are the most important essentials in the treatment of chorea."

**Serious Cardiac Lesions as a Sequel of Chorea.**—Dr. Theodore Fisher said: "The few remarks which it has occurred to me may be worthy of bringing forward in connection with this discussion, deal chiefly with the question of the frequency of serious cardiac lesions as a sequel of chorea. After two years or more had elapsed from the time of the onset of the acute attack Osler looked up 140 cases, and found in 72 signs of organic disease. Osler mentions also Stephen Mackenzie, who in 33 cases, which were examined after the lapse of two years, found 60.6 per cent. affected with cardiac lesions, and Donkin, who in 44 cases found 18 similarly affected at the end of the same time.

"I have traced 53 cases of chorea that have been under my own care, but have excluded all those in which the time of onset of the chorea was not more than three years before the time of examination. Of these 53 cases, 32 presented no murmurs, with the exception in a few instances of a pulmonary murmur probably due to anemia. Murmurs obviously due to organic disease were heard in 18 instances, and with these must be classed 2 cases which had died obviously of cardiac disease, making 20 in all in which serious cardiac lesions were or had been present. In the fifty-third case a systolic murmur was audible at the apex and another at the base. The nature of the apical murmur was somewhat doubtful. It may or may not have been due to anemia from which the girl to some extent suffered. Of the murmurs obviously due to organic disease, 9 were presystolic, 8 mitral systolic, and in 1 to and fro aortic murmurs were present.

"In passing it may be mentioned that the fact that in only 9 cases a presystolic murmur was audible is a point of some interest. Inflammation of the mitral valve, if it result in permanent defect, almost invariably by degrees produces stenosis of the mitral orifice. Puckering of the mitral valve cusps, allowing regurgitation only, may almost be described as a myth. It is scarcely necessary to remark, however, that a stenosed mitral orifice, with very few exceptions, allows regurgitation, and the systolic murmur due to this regurgitation may not uncommonly be the only murmur heard. Possibly in some of the 8 cases in which only a systolic murmur was heard mitral stenosis may have been present, but that nothing more than dilatation of the left ventricle, in which the mitral orifice shares, need exist in such instances, was shown by one of the fatal cases.

"Osler mentions that in 17 of his cases functional disturbance was present, and in some of these, murmurs which were thought to be probably secondary to anemia were heard. No murmurs, however, may be present after chorea, and yet obvious weakening of the heart may be present. In at least 4 of my cases in which no murmurs were audible, this weakening of the heart, judging from what the boys or girls said of their capacity for exertion, appeared to be definite.

"A point to be considered in connection with the frequency of cardiac lesions following chorea is the occurrence of rheumatism. Of the 32 cases in which no murmurs were heard in only 6 cases a history of definite rheumatism or of pain in the joints could be obtained, whereas in the 20 with cardiac lesions rheumatism had been present in 8. Osler's statistics on this point are very similar. Another question to be considered is whether repeated attacks of chorea are more likely to result in damage to the heart than one attack. Curiously enough, of 14 of my cases that had only one attack, 7—that is just half—had cardiac lesions, whereas in some in which attacks had been frequent the heart remained healthy. Thus the heart remained healthy in one case where there had been six attacks of chorea, and in another where there had been seven. In 15 of Osler's cases in which there had been three or more attacks, the heart remained healthy. A fact which also seems to me to be noteworthy is that of the 20 cases with permanent cardiac lesions, in 13 I examined the heart when the patient was suffering from the first or only attack of chorea, and in only one of those no apical murmur was to be heard. Some of these last-mentioned details seem to suggest that if the heart escapes during the first attack of chorea it is not likely to suffer during any subsequent attack.

"It is necessary, however, to consider in this connection the importance of murmurs heard during the acute stage of chorea. Murmurs are frequently heard both at the apex and at the base. The basic murmur, which was present in 23 of my cases when they were first seen, is not uncommonly described as hemic, and an associated systolic apical murmur may be considered to be of the same nature. It is not necessary, however, to conclude that these murmurs, when heard in cases of chorea, have any connection with anemia. A loud pulmonary murmur can certainly occur when there is no anemia, and may be so loud that, when conducted to the right of the sternum, it may be mistaken for an aortic systolic murmur. Not long ago I was calling upon a medical friend, who took the opportunity of telling me that he had a case of dyspnea, of sudden onset, in which I might be interested. On examination of the chest a loud and widely-conducted basic systolic murmur was found to be present, which my medical friend thought was aortic. Considering, however, the murmur to be pulmonary, not aortic, and believing as I do in Dr. Foxwell's explanation of the pulmonary systolic murmur, I thought the main abnormal condition of the heart was dilatation of the right ventricle. A few days later a necropsy proved that my suggestion was correct, and that the aortic valve and aorta were quite healthy. In another similar case, where a strong healthy sea captain was seized with sudden dyspnea, and a loud basic murmur was audible, after death the aortic valve was found free from disease, and the cause of the cardiac failure proved to be a gumma of the septum ventriculorum. Pulmonary systolic murmurs present in cases of chorea are with little doubt an indication of some dilatation of the right side of the heart, and systolic apical murmurs generally an indication of dilatation of the left side. The dilatation may as reasonably be attributed to the action of micro-organisms or of toxins upon the heart muscle as to anemia. Opportunities of examining the cardiac muscle in fatal cases of chorea in which pericarditis is absent are not common. Recently, however, I have had such an opportunity. Microscopical sections of the cardiac muscle stained with Sudan iij and hematoxylin displayed very definitely the presence of fatty degeneration of widespread character. Commonly, fatty degeneration, especially that associated with anemia, affects some muscular fibers more than others; but in this case, although in none the degeneration was extreme, every fiber in all the sections examined was dotted throughout with small granules of fat, the distribution being for the most part uniform, except that in many fibers the fat granules were most numerous in the neighborhood of the ends of the muscle-nuclei.

"It should be added that whether a systolic apical murmur heard during the acute stage of chorea be allowed or not to be due to a toxic condition of the car-

diac muscle causing dilatation of the heart, it is interesting to note that in many instances the murmur disappears. This happened in 12 of my cases. In most of those, it is true, the systolic murmur was not very well marked, but in 3 it was described as high-pitched. Curiously enough, however, in another case, one of those included in the 20 with cardiac lesions, the girl was examined a few weeks after she had recovered from her first attack of chorea, when a high-pitched systolic murmur which had been present was found to have disappeared; yet when the girl was examined nearly seven years later a loud and widely-conducted systolic murmur was audible. There had, however, been another attack of chorea.

"Osler's large number of cases gives a higher percentage of serious cardiac lesions following chorea than my own; but Donkin's series gives results approximately similar. Osler's cases show a percentage of just over 50 per cent. of cardiac lesions, Donkin's, however, only a fraction over 40 per cent., and mine a fraction under 40 per cent. The smaller number of cases of Stephen Mackenzie, however, gives as high a percentage as 60.6. Roughly, perhaps, we may say that about half the patients who suffer from chorea will be found within a a year or two to be suffering from cardiac disease, which can be detected upon auscultation. It should be borne in mind also that in a few cases in which no murmur can be heard the heart has probably been weakened by disease of the myocardium.

"In considering the probability of heart disease following chorea, it is well to remember, however, that when there is no history of rheumatism the likelihood of damage to the heart is comparatively small. It appears, also, that if no signs of affection of the heart can be detected during the first attack of chorea the heart will probably not suffer during any subsequent attack.

"It must not be concluded, however, that apical murmurs heard during the first attack are necessarily permanent. Systolic murmurs will disappear, and it is scarcely necessary to add that the dull diastolic sound so commonly heard over the hearts of children temporarily enfeebled from various causes, must not be considered as the precursor of a presystolic murmur, though, of course, in later years in some instances a presystolic murmur will be found to be present."

**Citrate and Iodide of Potassium.**—Dr. William Ewart said: "I think that the hesitation I share with many in prescribing large doses of salicylates, in the absence of obvious rheumatic symptoms, might be best overcome if Dr. Lees could supply evidence that they availed to curtail the duration of the attack. The frequent occurrence of slowing of the heart's action is an argument for avoiding overdoses. May not some of the good results noted have been due to the anodyne effects of the large doses of sodium bicarbonate? The efficacy of carbonic acid in relieving spasm and nervous distress is well known, whether the gas be inhaled, injected into the rectum, or disengaged in the stomach from its watery solutions or its salts. I have long discarded the combinations with the salicylates of the alkaline bicarbonates in large and frequent doses in rheumatic fever, because of the danger of setting up permanent gastric dilatation from the constantly recurring distentions with carbonic acid gas. I prefer to use the citrate of potassium, and invariably administer the iodide also, as suggested by Dr. R. Caton."

Dr. G. J. C. Thomson asked why large doses of the salicylates should not be given as soon as the patient came under observation, just as in rheumatic fever, in order to get the patient quickly under the full influence of the drug.

**Pathology of Chorea.**—Dr. F. J. Poynton said: "It is chiefly upon the pathological aspect of this question that I wish to speak a few words. I think we must maintain a philosophical attitude of mind in the study of chorea and recognize that positive facts are of greater value than negative, for there are great difficulties in such a study, because of the rarity of fatal chorea and because it is a condition which is liable to be considered from one point of view. Either by the neurologist as a nervous disease or by the bacteriologist with the aim of obtaining cultures. It is difficult to get both points of view studied, and the cases in which this has been done are comparatively few.

"Such facts as we have at present I would briefly tabulate thus:

"(1) Micro-organisms of the streptococcal group have been isolated from rheumatic fever. (2) They have been isolated from the cerebrospinal fluid and brain itself in chorea. (3) They have been demonstrated in the pia mater and brain. (4) Involuntary movements of a peculiar type have been recorded by Paine and myself and F. Meyer as resulting from intravenous inoculation of rabbits with such micro-organisms. (5) Identical bacteria are found in other rheumatic lesions in man, and are capable of producing the lesions of rheumatism in animals. (6) Chronic leptomeningitis has been noted in chorea by Dana. (7) The lesions found after death in acute chorea are such as one could explain on the view of an infection. I mean the minute thromboses and hemorrhages, occasional embolism, degenerative changes in nerve cells, and perivascular exudation commented upon by Dr. Lees."

**Hyperpyrexia in Chorea.**—Dr. Edmund Cautley said: "I have never yet met with a case of hyperpyrexia in chorea. Certainly if it occurs at all it is very rare. This may be urged as an argument against the view that chorea is 'cerebral rheumatism,' even though modified by the words 'in the great majority of cases.' In the worst cases, those in which there was much insomnia and excessive movements, I have obtained very good results by the frequent administration, every two or three hours, of small doses of chloral hydrate."

**"Air-hunger" in Chorea.**—Dr. George Carpenter said: "I wish to ask Dr. Lees his explanation of 'air-hunger,' and whether he has made any observations upon the blood in cases developing this symptom. I have found that salicylate of soda in excessive doses induces destruction of the red blood corpuscles in some instances. I have seen one instance of fatal hyperpyrexia in a choreic child, aged three years. I desire to call attention to the danger of arsenical multiple neuritis in unwatched cases, and I have seen several cases of shingles in those treated by arsenic. Albuminuria may also be produced. I do not regard arsenic as of much value in the treatment of chorea, and trust more to antipyrin. The latter drug sometimes produced measly and urticarial eruptions. The urine must be watched, for antipyrin in some cases gives rise to considerable albuminuria."

**Chorea Ascribed to Fright.**—Dr. Michael O'Sullivan said: "During the period of my connection with a children's hospital in Dublin I have had under my care 54 patients suffering from this disease. Forty-one of those were girls, whose ages varied from five to twelve years (the latter being the limit of age for admission of girls to hospital), and of boys there were only 7, whose ages were from five to ten years (the high limit for boys). The onset of the disease was, in a number of cases, ascribed to fright, such as being attacked, but not injured, by a dog, or in different other ways. The spasmodic and involuntary movements supervened after two or three days in most cases. On examining into the previous history of these children I found in most of them a rheumatic history of some sort. In some there was an account of rheumatism in the parents,

which, so far, had not shown itself in some of the children. In others there was a distinct history of the patient having had a genuine attack of rheumatism, and others complained of growing pains, which I consider are closely associated with a rheumatic tendency. Again some of the patients had rheumatic attacks during the progress of chorea. Of the various cases I have had under my care 50 per cent. had well marked organic murmurs, very few of which disappeared with the disease. I have, however, seen two undoubted cases of mitral regurgitation which got quite cured as the choreic symptoms passed away. Patients who have been without murmurs on admission have, however, often developed them during the progress of the disease, and these generally pursued the same course as the others. The lesion I have found most common in those cases of heart disease is mitral regurgitation.

"The various symptoms of chorea are too widely and thoroughly known to require recounting. There is one item which I have never seen mentioned by any author, and I myself have commonly observed in cases of chorea, and that is the large size and more or less flabby condition of the patients' tongues. I may say I rarely see patients without that condition of tongue. I had once a peculiar case of chorea (temporary) under my care. This was an attack which followed a rather prolonged administration of nitrous oxide gas, and lasted only about an hour. This patient was a girl seventeen years of age.

"The treatment which I adopt in almost every case is a combination of rest to mind and body. To prevent children learning lessons, and removing them from surroundings which might be too exciting, and capable of giving rise to frights and emotions. Warm baths are very useful, and easily digested nutritious food is absolutely necessary. Patients who are very violent should have their beds padded, and should be carefully watched that bedsores may not occur.

"With regard to medicinal treatment, I may say arsenic is practically the only drug I use. I prescribe it in 10 to 15 minim doses from the beginning, well diluted with water, and given during meal times. This occasionally disagrees with the stomach, and should then be discontinued for a time, when it will generally be found that the gastric disturbance will not recur on the readministration of the drug. In severe cases I prescribe chloral, and have on occasions given chloroform by inhalation. When chorea is complicated by rheumatism I always advise salicylate of soda."

Dr. J. R. Logan said: "Although shingles occurs in choreic patients taking arsenic, it is not always due to the drug, and may depend upon some trophic influence of the affected nervous system. I have seen well-marked herpes zoster in a child, with chorea, who was not taking arsenic."

Dr. Lees, in closing, drew attention to the necessity for sufficiently large doses of salicylate in the treatment of rheumatism and chorea. If the dose were too small, the desired results would not be obtained, and if the dose were too rapidly reduced there was the greatest probability of relapse. He related cases in illustration of this. He had seen one fatal case of hyperpyrexia in a choreic child.

**The Relation of the Thyroid Gland to Marasmus.**—Prof. John Ruhrah, of Baltimore, said: "The pathology of infant life has been to a certain extent a very much neglected field, and I feel positive that a rich harvest awaits the workers who will be painstaking enough to study both in the ward and in the deadhouse. In most places the necropsies on infants are hastily done, and the record frequently made in the report, 'Nothing abnormal noted.' As a matter of actual fact regarding many organs during infancy there are few who know normal from abnormal or who can tell from a microscopical examination what the microscope will reveal. There are, I am sure, clinical entities with well-marked lesions which are waiting to be described.

"As you all know, one frequently sees an infant sicken and die without diagnosis during life, and no adequate explanation after the necropsy has been made. Many of these cases come under the head of marasmus, and it was with the intention of trying to throw some light on this interesting condition that especial care was taken with our necropsies on infants. The following brief report, which I hope will stimulate others to undertake similar studies, is based on about 85 necropsies. The first 23 have been carefully tabulated by my colleagues, Dr. Stokes and Dr. Rohrer and myself, and while the remainder have not been tabulated they have been studied, and the conclusions reached from the first twenty-three remain unchanged.

"It is a curious fact that the most characteristic lesions of marasmus, excepting the wasting of fat and muscles, while known for many years, is not mentioned in any of the text-books on the diseases of children. This lesion is a wasting of the thymus gland which will be described later.

"Parrot, in 1877, called attention to the disease which he called athrepsia, the so-called wasting disease of infants, known also as marasmus, simple atrophy and atrophia primitiva infantum. The term inanition, also used, should be restricted to those acute cases of starvation which have a typical course and characteristic symptoms.

"There are two conditions in which we see atrophy in infants. The primary cases, where the cause is as yet unknown and those following definite pathological conditions, or the secondary cases. The dividing line cannot at this time be definitely drawn. All cases occurring in the course of the easily recognized diseases may at once be placed in the group of secondary cases, those following tuberculosis or syphilis for example. Clinically most cases are seen in infants which have had improper food and care. Some authors would also place these in the list of secondary cases. They would place under the head of primary atrophies only those where the assimilation was at fault; or, in other words, those cases receiving proper care and a physiologically correct diet. This is, we think, a division practically useless; and for the present until we have definite information the cases should be divided, on a pathological basis, into those where there are lesions of definite diseases, and those where there are no special and constant lesions except the wasting of the muscles and the body fat, and as we shall see of the thymus gland as well.

"We may safely assert, I think, that the trouble is not due to the amount of food ingested nor to the amount absorbed from the intestinal tract, but that it is due to malassimilation of the food material in the body. Whether the thymus gland has anything to do with assimilation or not we are not prepared to say, but it is certain that the thymus gland bears a direct relation to the state of the nutrition of the body. It increases in size until about the second year, when it remains stationary, growing relatively smaller when compared to the size of the growing body. At puberty, when the body growth is largely over, it begins to atrophy and at about twenty-five years of age, when the body has attained its full growth, it is gradually replaced by fatty and connective tissue.

"Herard, at a subsequent date Friedleben, and more recently Mettenheimer, have pointed out the relation of the size of the thymus to the state of nutrition of the body. Of this there can be no doubt, as it rests on a firm basis of trustworthy observation. The function of the thymus is as yet unknown, and the limited time at

my disposal prevents my even mentioning the observations and theories concerning it. The thymus gland weighs about 12 grams at birth. Histologically, it consists of a connective-tissue framework, holding up a parenchyma consisting of a cortex and medulla, which are similar in structure, but the cortex contains normally many more cells than the medulla. The parenchyma consists of a network of endothelial cells resembling the reticular spaces of the lymphatic structures. This space is filled with lymphoid cells, and also with a few neutrophilic and eosinophilic leucocytes, and with a few giant cells. Here and there in the structure are little islands of epithelial cells with a peculiar concentric arrangement not unlike that found in the concentric bodies of an epithelioma. These are the so-called Hassal bodies or corpuscles. They are the remains of the epithelium, which forms the principal part of the thymus gland during embryological development.

"Our studies cover 18 cases of marasmus. The average weight of the gland was 2.2 grams. Excepting the terminal infection, the atrophy of the thymus was the only lesion found in any of the autopsies. The changes in the gland consisted in a great atrophy. Histologically, the fibrous capsule of the gland is thicker than normal, and the trabeculæ are also greatly thickened, and the increased interlobular tissue frequently cuts the lobules up into irregular masses. Sometimes there is more fibrous tissue present than there is lymphoid structure. In well-marked cases there is more reticular tissue present than lymphocytes and leucocytes. In most of the cases there was an increase in size and a hyaline degeneration of the Hassal bodies.

"The state of the nutrition of infants may be estimated by a microscopical examination of the thymus. In those of normal infants the structure of the thymus is unaltered, and the differentiation between cortex and medulla is plainly visible. In moderate atrophy the cortex and medulla are not easily distinguished, while in severe atrophies the changes mentioned above are plainly seen.

"In secondary atrophy the change is one of degree, and we found in our cases the average weight of the thymus to be 3.41 gram.

"We tried the administration of the thymus gland tablet in cases of marasmus, and as far as could be determined there were no changes produced by the use of the gland in the dried form. We arrived at the following conclusions: (1) Atrophy of the thymus gland is always found in cases of infantile atrophy. (2) The condition of the thymus is an index of the general nutrition of the infant. (3) The state of the nutrition in infants may be estimated by a microscopic examination of the thymus at autopsy."

Dr. F. J. Poynton, in the discussion, asked Prof. Ruhrah's opinion upon a remarkable condition in children. Roughly, the symptoms were (1) enlargement of the thymus, even giving rise to a dulness behind the manubrium, (2) paroxysmal cough, (3) sudden death. These cases had been long recognized, but whether or not the symptoms were dependent upon the condition of the thymus was uncertain. He did not remember any relation between the size of the thymus and the condition of the body in these cases. They were very dangerous cases, and he raised the question because he would like to hear the experience of Prof. Ruhrah in this matter.

Dr. H. Ashby asked the writer of the paper for any observations he had made on "thymus death." In some of these cases the infants were well nourished and perfectly healthy, without any signs of rickets. Death occurred suddenly, and at the necropsy an enlarged thymus was found.

Dr. W. Ewart, in connection with the mode of causation of so-called "thymus death," called attention to the probability that the enlargement of the gland was not the only cause. Some other factor, such as pulmonary congestion or gastro-intestinal distention, of a more sudden nature, must be admitted. But the chief factor was, in his estimation, the individual cardiac weakness, which, in the adult, showed itself in the tendency to fainting and to sudden death.

Dr. George Carpenter was no believer in the condition of thymic asthma or of sudden death from an enlarged thymus. He had seen cases of enlarged thymus which did not produce any symptoms. He had also seen cases of tuberculous disease of the thymus which produced mediastinal tumors diagnosed during life, and which did not induce thymic asthma or sudden death. An enlarged thymus was a well-known physiological condition of infancy, and it did not produce clinical symptoms. He had no doubt in his mind that thymic asthma and sudden death in some cases were due to post-nasal catarrh, sometimes in association with adenoids, a condition which was not recognized and which he drew attention to. He called attention to a fact that should be widely known that digital examination of the nasopharynx produced in some instances a cough indistinguishable from whooping cough, and that it also produced spasm of the larnyx. His firm conviction was that so-called thymic asthma and sudden death from the thymus were in many instances in reality due to spasm of the larynx, which in the fatal cases did not relax. Thymus death was often death from laryngismus stridulus, and the sooner this was recognized the better. Pay more attention to the nasopharynx and thymic asthma will be a less fashionable explanation.

Dr. R. B. McVittie asked if the atrophic conditions of the thymus were, in Professor Ruhrah's experience, in any way associated with syphilis. In the cases which he had seen of sudden death, which would be likely to be attributed to what was called thymic asthma, the children were always very stout. It seemed to him most probable that they were cases where the heart was likely to be constitutionally feeble and easily stopped by some comparatively trivial circumstance, such as laying the child down after a full meal.

Dr. Theodore Fisher said the position he had always taken up was that in cases of sudden death the children were better nourished than those dying of chronic disease, and a normal thymus was consequently thought to be enlarged. He thought, in most of the cases, death was due to laryngismus stridulus, though evidently the case mentioned by Dr. Ewart would not come under that heading.

Dr. Ruhrah, in closing, said that as regards thymic asthma and thymus death he had had no personal experience. There were undoubted cases of thymus death, but he was inclined to think that some of those reported were due to other conditions, and that the normal thymus seemed unusually large, as the atrophied thymus was the one with which most of them were familiar. In one case which he observed the child died rather suddenly with convulsions and edema of the lungs. Quite a large thymus was found, but about a quart of potato salad was found in the intestinal canal. His investigations were undertaken with the idea of throwing some light on the pathology of marasmus, with hopes of finally finding some therapeutic measures of value.

**The Age for Operating in Cleft Palate.**—Dr. R. W. Murray said: "There is a considerable difference of opinion among surgeons as to the most suitable age for operating for cleft palate. Some delay operating until the child is between three to six years of age; others, again, operate during the first few weeks of life.

"In the case of a child born with a cleft palate there can be no doubt, from a purely theoretical point of

view, that the sooner the cleft is closed the better; at the same time, 'it is often wise to effect a compromise between that which is theoretically most desirable and that which is practically most advantageous, things being as they are.' The main object with which an operation for the closure of a cleft of the palate is undertaken is that the powers of speech may thus be rendered more perfect than they otherwise would be. If the operation is postponed until the fourth or sixth year of life, the child has then learned to talk, and necessarily to talk badly, a habit once acquired very difficult to overcome completely. At the same time, it must be remembered that the defective power of articulation in these cases depends upon other factors than the mere gap in the palate. I would particularly draw your attention to the fact that, if the cleft involves the bones of the hard palate, articulation will never be perfect, even though the child has been operated upon early in life, and the operation successfully performed. For example, if a child has a simple hare-lip, the alveolar margin and the palate being perfectly formed, the subsequent powers of speech will be in no way affected. But if as well as a hare-lip there is a slight notching in the alveolar margin (not, of course, amounting to a cleft palate), then, however early and however perfectly the deformity of the lip may be operated upon, the child will always talk with a lisp. The same holds good in regard to the posterior structures of the palate. If the cleft involves the whole of the soft palate, but does not include the hard palate, then, provided the cleft is closed before the child has learned to talk, there will be no noticeable defect of speech in after years. But if, on the other hand, the bones of the hard palate are involved, then, in spite of an early and successful operation, there will be a permanent defect in articulation, though this defect will not necessarily be directly proportionate to the amount of the bony deformity.

"The explanation, I believe, is that when the cleft involves the hard palate or alveolar margin, this defect in development is not limited to the structures of the mouth but also includes the nasal chambers, which are so largely concerned in the production of the voice, and therefore the imperfect articulation so characteristic of persons born with a cleft of the hard palate persists even though an operation for the closure of the cleft has been successfully performed. As further confirmation of this view that the cleft in the palate is not entirely responsible for the nasal character of the articulation, one has only to remember that from time to time we see children who speak as if there was a cleft of the palate, but on examining the mouth the only defect noticeable is that the palate is very highly arched, thus encroaching upon the nasal chambers. I believe this to be the explanation of the defective articulation in these cases, a condition which one could not hope to remedy by any operation upon the highly-arched palate. If then it is true that provided a cleft of the soft palate is closed before the child has learned to talk, the result, so far as speech is concerned, will be perfect, it necessarily follows that the operation for the closure of such a cleft should take place somewhere between the time of birth and say the end of the second year, always provided, of course, that the health of the child will permit of it. For my own part, I have no hesitation in saying that within this age limit the later the operation is performed the better.

"I know there are surgeons who hold different views, and who advocate and practise closure of the cleft during the first few weeks of life; in fact, in a case of hare-lip and cleft palate they operate upon the palate before operating upon the lip. In my experience this is a mistake, for every one will surely admit, other things being equal, the older the child the easier the operation, and, so far as a cleft of the soft palate only is concerned, I am convinced that a perfect result as regards articulation may be obtained provided the operation is performed about the end of the second year, and nothing better than this can be hoped for by operating during the first few weeks of life. On the contrary, during the first few months of life the tissues are so friable and the amount of material out of which to make a soft palate with so scanty, that after paring the edges there is very little soft palate or uvula left. This is a matter of considerable importance, for I believe the ultimate result in respect to articulation largely depends upon a good and freely movable soft palate.

"When, as is usually the case, there is a complete cleft both of the lip and of the palate, I operate upon the lip when the child is about three or four weeks old, and delay operating upon the hard and soft palate until about the end of the second year. It is quite remarkable how the closure of the lip influences the subsequent growth of the hard palate. I have noticed in a large number of cases where at the time of the hare-lip operation the gap in the alveolar margin of the palate has been considerable, that several months after the closure of the lip the alveolar gap has practically disappeared. This is to my mind a strong argument in favor of delaying the operation upon the palate, for the narrower the cleft, the easier the operation and the greater the probability of success. In this class of case, however, where the hard palate is involved, the subsequent powers of articulation, for reasons I have already mentioned, will always be somewhat defective. If, on the other hand, the soft palate only is involved, the prognosis is much more hopeful. I know of several children upon whom I operated for cleft of the soft palate before they could talk, and these children now articulate quite naturally, it being impossible to detect from their speech that they ever had cleft palates.

"I would emphasize the importance of training these children after operation to articulate correctly; they have the greatest difficulty with the 's' and the 'th,' and the plan I usually adopt is to get the mother to teach the child some nursery rhyme as 'Seesaw, Margery Daw,' and ask the child to repeat it to me from time to time."

Mr. Arbuthnot Lane, in discussing Dr. Murray's paper, said that he operated as early in life as possible—indeed, he preferred the day after birth. He gave the following reasons for this procedure: (1) That the nasopharynx was sooner exposed to the influence of the mechanical factor upon which its development depended; (2) that the operation was much easier at this age and more certainly successful, because of the absence of teeth and the much greater flap obtainable; (3) the child being in good condition it repaired well, and it displayed no irritation or annoyance whatever because of the operation.

Dr. H. Ashby asked the President for his experience in tracing in after-years the progress in articulation of those infants operated on during the first few weeks of life. There could be no doubt that those operated on when five or six years old talked with a nasal twang for many years, and required long training.

Dr. F. J. Poynton wished to know if the risk to life was not a real factor in operating upon a child under a week old. This was a most vital point. A dead child with a palate closed was a tragedy. The operation was a decorative, not a vital one. He would like to know from Mr. Murray and Mr. Lane if the dangers to life were not a reality in the first week of life.

**Discussion on Congenital Dislocation of the Hip.**—Dr. F. F. Burghard said: "Although the subject of congenital dislocation of the hip has been one of much interest to the profession ever since the publication of

the work of Hoffa and Lorenz, there has been an increased activity in the matter within the last two years, which is largely due, no doubt, to the use of the X-rays, whereby results can be accurately checked and vague general statements replaced by precise observations. Extended experience leads me to confirm the view that I enunciated in a paper read before the British Medical Association in 1901, that certain cases are more suited for one method and certain for the other, and that careful discrimination is needful to ensure success in treatment."

**Anatomical Changes Met with in Congenital Dislocation.**—"In order to arrive at a just conclusion as to the best method of treatment it will be well to mention briefly the various anatomical changes met with.

"The most pronounced and invariable change, and one that is present from the earliest period of life, is found in the acetabulum; it is also of primary importance in the treatment of the affection. Instead of being the normal hemispherical cup looking downward, outward, and forward, it is a shallow triangular depression looking almost directly outward, and with its apex directed upward. Moreover, its upper margin, which in the normal joint plays a prominent part in retaining the head of the bone in the acetabulum, is very defective, and is quite incapable of exerting any retentive function. It is this shallowness of the acetabulum that renders easy the reluxation that so often occurs after an apparently successful reduction of the dislocation.

"Another point of the highest practical importance, and one that does not seem to have hitherto attracted its due amount of attention, is the arrangement of the capsule of the joint and the changes that different portions of it undergo. It serves to explain a number of cases in which the 'bloodless method,' although apparently successful at the time, fails eventually, and dislocation recurs a few days or a few weeks after the operation. An examination of museum specimens and an extended experience of the open operation has impressed upon me the great importance of this anatomical factor. Attention was first called to the matter by Hoffa, and its importance has been more recently emphasized by Bradford and Nicholls. The following account, translated from Hoffa's well-known work on Orthopedic Surgery, puts the matter concisely.

"'The capsule rapidly undergoes alterations in shape and assumes a somewhat hour-glass form. Starting from the posterior edge of the acetabulum it passes over the head of the bone, over which it is accurately applied, so that the outline of the head can be seen clearly beneath it. It then runs forward and downward and becomes firmly adherent to the acetabulum, so as to make with this flattened cavity a narrow pouch, the so-called "acetabular pocket" of Lorenz, from which the ligamentum teres, when present, emerges to reach its insertion into the head. This lower portion of the capsule thus forms a sort of diverticulum which only communicates with the upper spacious capsular cavity, in which lies the head of the bone, by an isthmus, the so-called *rétrecissement* of Bouvier. This narrowing is really caused by the passage of the iliopsoas tendon across the capsule at this spot. It is not in this form only that the capsule undergoes changes; its consistence also alters. The entire anterior and inferior portion becomes abnormally thickened, so that the portion lying like a lid over the acetabulum becomes exceedingly dense and unyielding. In this the various capsular bands, and especially the Y-ligament, play an important part.'

"These changes in the structure and arrangement of the capsule have a twofold action in preventing a true cure of the dislocation. In the first place it may be impossible to cause the head of the bone to pass beneath the lid formed by the anterior part of the capsule and lie truly in the acetabulum without some open operation accompanied by detachment of the capsule from the acetabulum. In the second place this capsular lid may become interposed between the head of the bone and the acetabulum in cases in which the bloodless reduction is apparently successful, and this will lead to such an unstable joint that reluxation will readily recur. That this is the true explanation of some of the failures of the 'bloodless method' I have been able to assure myself when practising the open operation; it has apparently been possible to reduce the dislocation by manipulations, but examination by the finger in the wound has shown that the head of the bone has merely been made to lie over the acetabulum, the thickened anterior wall of the capsule forming a dense partition between them. In other words the case is one of spurious reduction.

"Nor are the changes that occur in the femur of inferior importance. Foremost among these is the increase that occurs in the angle made by the long axis of the neck of the femur with the transverse axis of the femoral condyles. In the normal subject this angle varies between 15 and 25 degrees, but in every case of congenital dislocation it is increased, and may be as great as 80 or even 100 degrees. This torsion of the femoral neck generally takes place in the forward direction, so that, when the head is properly in the acetabulum, the entire lower limb is rotated more or less strongly inward, according to the extent of this so-called 'angle of femoral torsion.' It is said that this torsion may be so extreme in adults as to require an osteotomy to remedy it. Personally, I have only found it very marked in three cases; in two it yielded to well-applied traction and movements, but in the third case—which is still under treatment—the torsion is very extreme, being, as nearly as I can judge, quite 90 degrees. These three cases are all young children.

"Another very important change in the femur is the alteration in the angle made by the neck with the shaft. The normal angle is about 120 degrees, varying between 110 and 140. In cases of congenital dislocation, however, it undergoes diminution, and may be as small as 90 degrees. The diminution is slight before the child begins to walk, and its degree is to some extent proportionate to the length of time that has elapsed after the child has learnt to walk.

"The changes in the head of the bone itself are rarely marked, except when the dislocation has persisted untreated for years. In early life the head is rather diminished in size, and its general outline is somewhat pyramidal from flattening of its inner aspect against the outer surface of the ilium, but it is only when the dislocation has lasted for several years that the irregular mushroom-shaped head described in the text-books is seen.

"The alterations in the ligamentum teres are various. As a rule it is absent altogether; when present it is always elongated and often very thin. The changes that take place as growth progresses are not constant either in kind or in degree. The most important alteration—and one that is very common as far as my expereince goes—is a change in the anatomical variety of the dislocation; that is to say, a dislocation which in early life is a true dislocation upward becomes, as life advances, a dislocation upon the dorsum ilii. When this occurs there is the characteristic loose joint, the extreme waddle in walking, and increased shortening. The acetabulum always gets shallower as the child gets older, and at the age of sixteen I have found it barely perceptible to the finger when the joint was cut down upon. It invariably remains, however, as a shallow but quite definite depression throughout life. The diminution in the angle made by the neck of the bone with the shaft increases, and the head assumes the typical

mushroom form. The anterior portions of the capsule become still more shortened and thickened. It will thus be seen that there is a definite reason for the admittedly great want of success in the treatment of cases that have been allowed to reach some age before the affection is taken in hand. At the age of puberty the anatomical changes are so advanced that it may be mechanically impossible to get the head of the bone into the normal position in the acetabulum. The usual result of untreated cases is a large, loose, sliding joint between the head of the femur and the outer surface of the ilium, with its concomitant deformity, although the case reported by H. Morestin shows that a perfectly stable, though imperfect, joint may occasionally arise even without treatment of any kind.

"The form of dislocation met with in practice varies somewhat according to the age at which the patient comes under notice. It seems to be the general impression that there is a true dorsal dislocation in the majority of cases, the head of the femur moving freely over the outer surface of the ilium. This is no doubt the case in the older children—those, for instance, over six years of age; but in my experience the common form of dislocation seen in young children, and probably the almost universal form at a very early age is a true dislocation upward beneath the anterior superior iliac spine, the so-called 'supracotyloid' form. This form of dislocation is, however, an unstable one, and, as age advances and the weight of the body increases, it is apt to become transformed into the common dorsal dislocation, the head passing on the dorsum of the ilium. There is yet a third form that is occasionally met with; here the head of the bone passes upward and backward, and occupies a position above and behind the normal acetabulum intermediate between the two varieties just described. This variety is very unstable indeed, and soon becomes transformed into the true dorsal form. There is much less interference with the normal gait when the dislocation is directly upward, and it is these cases that are often overlooked.

(To be Continued.)

## BOOK REVIEWS.

Reference Handbook of the Medical Sciences. Embracing the Entire Range of Scientific and Practical Medicine and Allied Science. By various writers. A New Edition completely Revised and Rewritten. Edited by Albert H. Buck, M.D., of New York. Vol. VI, Mos-Rye. William Wood & Co., New York.

The present volume contains an immense amount of material, well systematized and thoroughly up to date. We cannot add much to our previous encomiums of this work, save to repeat that we know of no single work of reference which in any way compares with this "Reference Handbook." It is a veritable *vade mecum* and, the reviewer believes, should be found in the library of every wide-awake practitioner of the country.

Articles of special interest are numerous. We might signalize some for special mention. Thus the article on Muscles with Muscular Dystrophy; a consideration of the subject of Nasal Cavities with their attendant diseases; the article on Naval Hygiene, which is remarkably full, as is also the article on Nematodes might be chosen. The general consideration of Nerves, Nervous Injury, Neurology, Neurasthenia, Neuritis, Neurones and Neuroses is thoroughly modern and complete.

A very interesting article is one on the relation of Occupation to Disease, and we do not know where we have seen an article on Diseases of the Esophagus so well considered from all points of view as that in the "Reference Handbook." The discussion of the Ophthalmoscope is too full even for a specialist. Organotherapy, Pain, Pancreas, Paralysis and its related phenomena are all well considered. There is a very excellent plate on the Eggs of Human Parasites, a better collection than we have seen anywhere. Other sections worthy of mention are Perineum, Phagocytosis, Pharmacopœias, Placenta, Plasmon, Poisonous Plants, Poisonous Reptiles, Poisons, Premature Infants, Quarantine, Recruits, Reflexes, Refuse Disposal, Reparative Surgery, Resection of Joints, Rheumatism, and Roentgen Rays.

As this excellent book nears completion, its masterly character becomes more and more evident and we hope for it the wide popularity that the work of both editor and publisher deserves.

The Praxis of Urinary Analysis. A Guide to the Chemical Analysis of Urine, with Directions for Preparing Artificial Pathological Urines for Practising the Various Tests and an Appendix on the Analysis of Stomach Contents. By Dr. Lassar-Cohn, Professor in the University of Königsberg. Authorized Translation from the Author's Enlarged and Revised Second Edition by H. W. F. Lorenz, A.M., Ph.D. (Berlin). John Wiley & Sons, New York.

This booklet of 56 pages contains only what is absolutely essential for the chemical analysis of the urine; it being the intention of the author to make the subject appear in its simplest form and to avoid confusing the beginner with many tests. An equally brief chapter on stomach analysis is appended. The volume seems to be intended more for pharmacists, as the microscopical examination of urine is not touched upon and the physician would really have to resort to another treatise for a complete analysis. An original feature is the preparation of artificial pathological urines for practising the various tests.

Post-Mortem Pathology. A Manual of Post-Mortem Examinations and the Interpretations to be drawn therefrom. A Practical Treatise for Students and Practitioners by Henry W. Cattell, A.M., M.D., Pathologist to the Philadelphia Hospital and the West Philadelphia Hospital for Women, etc. J. B. Lippincott Company, Philadelphia and London.

We have long felt the want of a good English book on gross pathology, and those of us who are obliged to do pathological work have always been conscious of how poor our own literature is in books on this subject. The volume before us cannot be recommended too highly; it stands on the same level with Orth's and Nauwerk's works, and should not be missing in any hospital library. After chapters on General Consideration, Records and Note-taking, Post-Mortem Instruments and Their Use, and Care of the Hands, Virchow's and Orth's Methods of Performing a Complete Autopsy described in full with such modifications as law and custom in this country demand. Then the various organs are taken up in detail and their different pathological conditions described most graphically. New and original suggestions and practical hints abound everywhere. The restoration and preservation of the body is not neglected and in the chapter on the preservation of tissues for microscopic and macroscopic purposes, the methods of Kaiserling and Pick, so commonly employed in Germany at present, receive a detailed description. Comparative post-mortems, medicolegal suggestions and Prussian medicolegal post-mortems are each discussed in a separate chapter, and appended to the book there is a list of usual causes of death with synonyms. Last but not least, mention must be made of the numerous excellent illustrations in this volume; they are remarkably clear and illustrate the various steps so much better than words.

# THE MEDICAL NEWS.

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## ORIGINAL ARTICLES.

### THE ETIOLOGY AND CHEMICAL PATHOLOGY OF GALL-STONES.*

BY C. A. HERTER, M.D.,
OF NEW YORK.

ALTHOUGH the methods of modern surgery have perhaps robbed gall-stones of some part of their medical interest by lessening their menace to life and by doing much to prevent their recurrence, gall-stone pathology remains a fascinating field for the experimentalist and is not wholly without promise for the student of preventive medicine and therapeutics. It is the purpose of this paper to deal with our present knowledge of the conditions that attend the production of human gall-stones, and, pointing out some gaps in this knowledge, to suggest problems for further research.

The well-known variety in gall-stones, as regards their chemical constitution and the arrangement of material within the concretions is in itself an indication that the conditions of stone-formation are not always the same. Thus the cholesterin stone, consisting almost wholly of cholesterin, disposed in radial crystals about a small débris center, speaks for a very different developmental history from that of the bilirubin-calcium stone containing little or no cholesterin. In the following pages some explanation will be offered for these varieties in chemical constitution.

*Origin of the Chief Constituents of Gall-stones.*—Since cholesterin and bilirubincalcium are by far the most abundant and regular constituents of gall-stones, it is desirable to consider their origin and the conditions attending their appearance as constituents of calculi.

1. *Cholesterin.*†—This monatomic occurs in bile from human fistulæ in only low percentage.‡ In bladder bile the percentage is somewhat higher.§ The greater proportion observed in the cystic bile can almost certainly be attributed in part to cholesterin derived from epithelial cells lining the gall-bladder and not to a concentration of the bile from absorption of water.

Of the origin of the cholesterin of the hepatic bile little is known. A part is probably obtained from the blood and it is likely that diseases attended by a considerable increase in the cholesterin of the blood (as in some cases of diabetes) lead to the passage of an excessive quantity of the compound into the bile, but it must be admitted that there is no convincing evidence on this point. There also remains much to be learned as to the origin of the cholesterin found in normal blood. We know that this substance can be obtained from columnar or cuboidal epithelial cells and that it occurs in the central nervous system. Probably it is a normal cleavage product of larger molecules, but its biological significance is still obscure.

When cholesterin is found either in the crystalline or amorphous state in larger or smaller concretions on the floor of the human gall-bladder it is commonly assumed that this cholesterin has been precipitated from a bile that is over saturated. In many instances this is doubtless a correct view, but I think it can be shown that many small masses of cholesterin arise in a wholly different way through the aggregation of very small globules of intra-epithelial material. From the gall-bladders of patients dying of chronic nephritis and other chronic diseases, are sometimes freed numerous small, dark, friable masses of less than pinhead size, which lie in the dependent parts of the bladder. On examining these masses with the microscope they are seen to consist of epithelial elements which have become highly granular and have lost their normal structure through degenerative alterations. This epithelial débris is commonly stained with bile pigment. It does not contain cholesterin crystals. Nevertheless when a drop of concentrated sulphuric acid is added to some of this material it gives a characteristic and marked reaction for cholesterin. The amorphous finely divided cholesterin which gives this reaction cannot reasonably be regarded as a precipitate from the bile but it is much more likely to be the direct derivative of epithelial cholesterin. The fact that the bile often contains an excess of cholesterin under these conditions is not opposed to this view, for one would expect that the bile would take up the cholesterin of epithelial origin until it has become quite saturated, after which there would be a liability to crystalline separation at any time.

It is probably true that cholesterin is sometimes separated from a saturated biliary solution owing to some alteration in the composition of the cystic bile which renders the lipoid material less soluble, but it is unlikely that such alterations in the solvent powers of the bile play an important part in the genesis of calculi. The solvent

*Read before the Congress of Physicians and Surgeons, May 13, 1903.

†Outline of Ritter's Method for Estimation of Cholesterin in Bile: Weighed amount bile is evaporated to dryness on H bath—and sodium alcoholate added. The whole is kept at a gentle boil on $H_2O$ bath for two to three hours—then alcohol evaporated off. The residue is taken up in $H_2O$—c.p. NaCl added, then evaporated. The thoroughly dried residue is placed in filter cap and extracted with pure dry ether in Soxhlet's extractor for nine hours. The ethereal extract is filtered, ether removed, and the residue, composed of cholesterin, is weighed. To purify, dissolve residue in a little hot alcohol, and add $H_2O$ to the solution in small quantities at a time. Cholesterin separates out, and may be filtered, dried and weighed.

‡Copeman and Winston found .099 per cent., Mayo Robson .045 per cent., Noël Paton and Balfour .062 per cent.

§Observations made by Dr. Baldwin in my laboratory indicate that the cholesterin content of human cystic bile is commonly about .1 per cent.

action of the bile for cholesterin depends in some degree on the biliary soaps and fats and especially on the bile-salts. A certain degree of alkalescence to litmus such as prevails in normal bile (human and canine) is favorable to this solution. There is no definite knowledge of any metabolic peculiarity or anomaly in man which leads to a diminished secretion of biliary salts.* Nor do we know of significant changes in the concentration of the soaps and fats. The reaction of the cystic bile in this connection deserves more attention than it has received but the opportunities of studying it in fresh human bile are necessarily very limited.

It is claimed by some writers that acid-producing bacteria give rise to an acid reaction of the bile.† There is, however, no satisfactory evidence that this occurs. The bile contains no appreciable reducing substances‡ and probably no fermentable carbohydrates. We know also that one organism, the typhoid bacillus, may be the sole excitant of gall-stones containing cholesterin although it is not an acid producer in ordinary media. Whether the cystic bile ever has an acid reaction in consequence of a diathetic acid intoxication cannot be positively stated but there are facts that render this most unlikely. Hence it may be said that although an acid bile is favorable to the separation of cholesterin there is no evidence at present to justify us in believing that pronounced acidification of the bile is essential to the formation of cholesterin gall-stones.

*Excessive Cholesterin Production is the Chief Factor in the Production of Cholesterin Concretions.*—The view that the cholesterin of gall-stones arises from the mucous membrane of the gall-bladder is not new. Budd suggested it in 1845, Bristowe revived it in 1887 and Naunyn became its earnest advocate in 1892. The facts that have appeared to speak most strongly for the local origin of cholesterin are two. First is the observation that epithelial cells desquamated from the mucous membrane of the gall-bladder soon undergo degenerative alterations attended with the production of new cholesterin, which in time may take on a crystalline form. This accords with the similar observation that degenerating epithelial cells derived from the bronchial mucous membrane in catarrh and putrid bronchitis often contain cholesterin. The occurrence of this substance in old pus and in old cysts also points to a local origin. Secondly, there is the observation, reported by Naunyn, that the administration of cholesterin to a dog was not followed by an increase of this lipoid in the bile. Although it is stated that the cholesterin was absorbed, the experimental conditions appear not to have been wholly satisfactory for testing the question whether an excess of cholesterin in the blood leads to an increased percentage in the bile* We cannot exclude the possibility that there are occasional disorders of nutrition attended with an increase of cholesterin in the blood serum and hence with an increase in the bile.†

Experiments made in my laboratory by Dr. Wakeman give strong support to the view that inflammatory conditions in the walls of the gall-bladder may lead to an increase in the cholesterin of the bile. Dr. Wakeman injected (under aseptic precautions) strong solutions of bichloride of mercury, carbolic acid, ricin, abrin and diphtheria toxin into the gall-bladders of dogs that had fasted for three days. After periods of three to four days the animals were killed. The gall-bladder walls were usually much thickened (especially in the bichloride series) and showed considerable proliferation and desquamation of epithelium together with congestion of the vessels of the submucosa. The solids of the bile were diminished in percentage in the bichloride series. The cholesterin of the bile was markedly increased in the bichloride series, in the carbolic acid series and in the ricin series, the change being especially noticeable in the cholesterin content of the solids. The abrin series and the diphtheria toxine series must be regarded as negative, which corresponds to the absence of structural changes in the mucous membrane of the gall-bladder. Some idea of these results may be obtained from the following table:

Table I.

Injection into dog's bladder of

| | | Normal | $HgCl_2$ | $C_6H_5OH$ | Ricin | Abrin | Diph. Toxin |
|---|---|---|---|---|---|---|---|
| Number of observations | | 20 | 12 | 7 | 6 | 5 | 8 |
| Amount injected | | | .02 to .1 grm. | .15 to .4 grm. | 9 to 12 mg. | 1 to 1.75 | .08 to .4 c.c. |
| Total bile, per cent. | | | | | | | |
| Cholesterin, | Average | .127 | .298 | .334 | .427 | .132 | .167 |
| " | Highest | .260 | .458 | .940 | .823 | .231 | .235 |
| " | Lowest | .051 | .137 | .056 | .076 | .070 | .054 |
| CaO | Average | .077 | .064 | .072 | .079 | .110 | .094 |
| " | Highest | .115 | .166 | .111 | .150 | .134 | .155 |
| " | Lowest | .047 | .018 | .045 | .033 | .077 | .055 |
| Total bile solids, per cent. | | | | | | | |
| Cholesterin, | Average | .438 | 2.56 | 1.47 | 2.54 | .628 | .795 |
| CaO | " | .360 | .614 | .688 | .496 | .537 | .437 |

Previous to death, the dogs were starved three to four days; those receiving injections were killed three to four days after.

The observed increase in cholesterin, which is especially pronounced in the case of the ricin series, depends partly on the presence in the bile

*A vegetable diet is supposed to diminish the bile-salts and a meat diet to increase them. It is uncertain, however, that these physiological factors assume pathological significance. It has also been thought that decomposition (putrefactive or fermentative) of the bile-salts in the cystic bile reduces the solvent action for cholesterin, but Minkowski showed that the cholalic acid thus liberated still possessed solvent action.

†Dott. F. E. Halia, Batteri Della Calculosi Biliare Coltivati Nella Bile, La Reforma Medica, Vol. II, N. 70, 1901. This observer found in filtered and sterilized ox-bile that colon bacilli and typhoid bacilli gave an acid reaction to bile which had been rendered alkaline. He regards these organisms as the specific exciters of cholesterin stones. The results obtained by Halia do not accord with those obtained by Dr. Dunham on human bile.

‡This conclusion was reached by Mr. Rettger from a careful study of pig's-bile.

*The difficulty in carrying out such experiments is considerable, owing to the insolubility of cholesterin in water and its resistance to saponification. It is impossible to insure prompt absorption from the intestine or from the peritoneum and intravenous injections of finely divided substance cause death from embolism. We have not succeeded in heightening the cholesterin content of the bile by experiments of this kind, but do not consider our experiments conclusive as to the question at issue.

†It is extremely probable that the converse is also true and that conditions causing an obstruction to the outflow of the bile lead to an increase in the cholesterin of the blood. This was claimed by Frerichs to be the case. Observations made in my laboratory but not yet completed point to the conclusion that this view is correct.

of cholesterin holding epithelia,* partly on an increased solution of cholesterin† (also of epithelial origin) in the bile. One would anticipate that under these conditions the bile would become saturated with cholesterin and thus prepare the way for the deposition of cholesterin from the bile, perhaps in crystalline form. Crystals of cholesterin were not observed in any instance among the remains of desquamated epithelial cells in the gall-bladder, but these negative results are not surprising if one considers the short duration of the experimental observations.

An increase in the cholesterin in the bile may be observed after slight mechanical injuries to the mucous membrane of the canine gall-bladder, after the intracystic injection of cultures of human colon bacilli, after phosphorus poisoning and after a prolonged diet of fat. Bacteria are certainly not essential to the production of the catarrhal inflammations which are attended with an increase in biliary cholesterin. I have several times found the bile to be sterile in mercurial and other inflammations excited by Dr. Wakeman.

*Cholesterin Content of Human Cystic Bile.*—At my request Dr. Helen Baldwin has made observations on the cholesterin content of the human cystic bile obtained from more than sixty autopsies. The results of her earlier analyses are given in the following table:

TABLE II.

Showing Cholesterin Content of Human Cystic Bile in Various Conditions (based on 40 autopsies).

| | | |
|---|---|---|
| Average of all the cases (excluding 8 cases of acute lobar pneumonia and 3 cases with cholesterin stones) | 0.13 | per cent. |
| Average in 6 cases of acute miliary tuberculosis (excluding one case with large cholesterin stones) | 0.167 | per cent. |
| Average in 12 cases of chronic nephritis | 0.20 | per cent |
| Average in 8 cases of acute lobar pneumonia | 0.248 | per cent. |
| Average per cent. solids of bile in 8 cases of acute lobar pneumonia | 11.7 | per cent. |
| Average per cent. solids of bile in 50 cases analyzed | 11.3 | per cent. |

There are some points connected with these figures that call for brief comment. In order to obtain strictly normal values for the cholesterin of human cystic bile one would be almost wholly restricted to the results found for biles obtained from healthy individuals who have died by accident. The average given in the table (0.13 per cent.) is based on a series of autopsies which include some instances of sudden death by accident, but which also include a large proportion of deaths from the ordinary causes. These autopsies include, for instance, the series on persons with chronic nephritis. There is consequently no doubt that the average obtained is too high for normal individuals, who would probably give a percentage not very far from 0.1. Nevertheless the comparison with the values found in other groups of cases is of interest.

The relatively high percentage (0.20) found for the 12 cases of nephritis is noteworthy and can hardly be regarded as accidental, although its interpretation is not yet clear. Possibly it depends on an increase in the cholesterin of the serum of the blood connected with the existence of widespread arteriosclerosis in these cases, but it may be due to local conditions in the gall-bladders dependent on the colon bacillus infection which is so common in persons with advanced nephritis. The bile from persons dead of chronic nephritis often contains a dark sediment of very small granules which seem to consist largely of cholesterin and some of which may possibly be the nidus of future gall-stones. The high percentage noted in the cases of pneumonia are also of interest although here again the interpretation of the results is difficult. Possibly the excessive cholesterin is connected with infection of the bile and bile-passages. It would certainly be interesting to know whether the liability to gall-stones is greater among persons who have had pneumonia than among those similarly conditioned who have not had the disease.

It is not unlikely that there are temporary infections of the cystic bile which lead to a temporary increase in cholesterin which gradually returns to normal after the subsidence of the infection.

The bile from gall-bladders containing cholesterin stones is certainly apt to contain an uncommonly high percentage of cholesterin. Thus in one instance the proportion reached 0.308 per cent., in another 2.42 per cent. On the other hand where pigment stones are present the cholesterin of the bile may not exceed 0.014 per cent.

*Calcium.*—Our knowledge of the calcium of the bile in health and in disease is rather less satisfactory than that which we possess respecting cholesterin. We know that the calcium content of canine cystic bile is normally from 0.050 per cent. to .090 per cent., whereas the percentage in

*In collecting the bile for analysis the loosely adhering cells were in every case (in both normal and pathological gall-bladders) gently removed with a dull spatula and added to the remaining contents of the gall-bladders.

†From experiments made by Mr. L. F. Rettger at the Sheffield Scientific School, it is probable that some general protoplasmic poisons are capable of increasing the cholesterin within the gall-bladder. Thus after a period of phosphorus poisoning of eight days' duration, Rettger found the gall-bladder of a rabbit studded with masses about the size of a pin-head, which responded to the chief tests for cholesterin. The bile was sterile. In three other rabbits, similarly treated, no such masses were found.

*Note.*—The following observations on the solubility of cholesterin in pigs' cystic bile are of some interest. The analyses were made by Mr. L. F. Rettger. Four portions of same bile, fresh and normal, were taken:

*a.* 100 c.c. unfiltered; amount of cholesterin..... 0.040 gm
*b.* 100 c.c. filtered through good filter paper; amount of cholesterin in filtrate..... 0.044 gm.
*c.* 100 c.c. frozen two weeks and filtered; filtrate thoroughly washed; amount of cholesterin..... 0.042 gm.
*d.* 100 c.c. inoculated with culture of human colon bacillus and incubated two weeks; cholesterin in bile ..... 0.036 gm.

Similar observations on normal bile filtered and unfiltered gave comparable results to (*a*) and (*b*).

100 c.c. of normal pigs' bile inoculated with culture of human colon bacillus and contaminated with an unrecognized putrefactive organism, was incubated for two weeks. No bile became putrid. Amount of cholesterin after putrefaction ..... 0.0365 gm.

This represents a loss of 0.0205 gm. during putrefaction (based on comparison with control).

The following observations relate to the influence of acid on the solubility of cholesterin:

Two portions of fresh pigs' bile were taken.

*a.* 100 c.c.; amount of cholesterin..... 0.0883 gm.
*b.* 100 c.c.; 3 c.c. normal HCl solution. Allowed to stand 4 days at room temperature. Filtered and residue thoroughly washed. Amount of cholesterin ..... 0.0781 gm.
(Difference=0.0102 gm.)

the blood is considerably lower.* We know also that the calcium content† of human cystic bile does not normally differ materially from that of canine cystic bile and is commonly below 0.10 per cent. Why the percentage of calcium in the bile is higher than that of the blood, and higher even than that of the serum, is not yet clear. It appears improbable that the difference is due to the absorption of water from the gall-bladder and it is more likely to be dependent on an actual addition of calcium to the cystic bile. This point could be settled by a comparison of the calcium of the blood serum with that of the hepatic and cystic bile in the same patient or experimental animal, but the necessary observations appear to be wanting.

A noteworthy thing about the cystic biliary calcium in pathological conditions is that it seldom varies greatly in percentage from that of normal bile. In this respect the calcium of the bile stands in marked contrast to the cholesterin. The comparative uniformity of the calcium values is observable both in experimental and human pathological conditions. Thus in the experimental inflammations of the gall-bladder, already referred to, the average calcium content of the bile was not greater than the average of the normal biles. This applies to the experiments with bichloride of mercury and to those with carbolic acid and ricin. (See Table I.) Increased cholesterin, however, is a feature of these experiments and has been commented upon already. This independence of the calcium and cholesterin of the bile is of interest when we consider the varying composition of gall-stones in respect to their constituents.

A moderate increase in the percentage of biliary calcium, or at least high values for calcium —was observed in some of the cases of experimental cholecystitis. The highest percentage observed in any case relates to one of the mercury experiments where the calcium reached 0.166 per cent. In the cases where the calcium appeared to be high no explanation of the fact has been evident. The calcium content of the blood serum in such cases was not ascertained.

In human pathological conditions, also, the calcium of the bile seldom shows any remarkable increase above the normal. The average calcium in Dr. Baldwin's‡ 40 observations was 0.072 per cent. Three times only was the calcium in excess of 0.120 per cent. Once it reached 0.272 per cent., once 0.214 per cent. and once 0.181 per cent. The solids in these instances were exceptionally high (17.7 per cent., 21.5 per cent. and 21.7 per cent.) but there is no close relationship between calcium and solids in the 40 observations regarded as a group. Neither is there any relation between the cholesterin content of these human cystic biles and their cholesterin. High cholesterins with low calcium are very common. High calcium with low cholesterin is less common but is sometimes a striking feature. Thus in a case of lobar pneumonia in which the calcium value was 0.272 per cent. the cholesterin was only 0.136 per cent. In 7 cases in which the calcium was in excess of 0.10 per cent. advanced chronic nephritis was present in 4 instances.

It should also be mentioned that in two cases in which the gall-bladder contained pigment stones the calcium content of bile was low, in one case 0.046 per cent., in the second 0.018 per cent. These observations suggest that a high percentage of calcium is not a prerequisite for pigment stone production, although there is no proof that the calcium of the bile was normal at the time when the stones were in process of formation.

What is the source of the biliary calcium in those cases where this element is present in excess? A satisfactory answer to this question cannot at present be given but there are several considerations which give at least a clue to the answer. The very high calcium percentage in the bile, as compared with the normal calcium percentage of the blood serum, in some pathological conditions, makes it unlikely that the excess of calcium comes directly from the blood into the hepatic bile. The widely held view that persons living in limestone districts are especially liable to gall-stones led Jankau to feed a dog large doses of calcium phosphate, neutral calcium phosphate and calcium lactate in order to determine whether the biliary calcium could be thereby increased. He obtained negative results. This experiment cannot, however, be regarded as establishing the doctrine that the calcium of the food (and hence of the blood) under no circumstances influences the biliary calcium. An increase in the calcium of the blood may be followed by a moderate increase in the calcium of the bile for Dr. Wakeman found the average calcium content of the cystic bile of 20 normal dogs to be equal to 0.077 per cent. of calcium oxide, whereas in the biles from 12 dogs intravenously infused with a calcium chloride solution* the average percentage was 0.886 per cent., and in one instance reached 0.152 per cent. which is distinctly higher than any normal observed. Although the experimental conditions were unlike any that arise in man these observations leave it an open question whether the calcium of the bile may not be somewhat increased if for any reason the calcium content of the blood is heightened. But it appears improbable that a considerable excess of calcium can be accounted for in that way and it is furthermore unlikely that concentration of the cystic bile is an important factor, even where the effects of concentration are added to those of a high calcium percentage in the blood.

*The following observations on the calcium of the blood and the cystic bile from the same dogs are not without interest.

| | Per Cent. | Per Cent. |
|---|---|---|
| Dog I. | CaO of bile.. 0.078 | CaO of total blood..... 0.0153 |
| Dog II. | CaO of bile.. 0.068 | CaO of total blood..... 0.0116 |
| Dog III. | CaO of bile.. 0.056 | CaO of total blood..... 0.0091 |
| Dog IV. | CaO of bile.. 0.044 | CaO of total blood..... 0.0091 |
| Dog V. | CaO of bile.. 0.068 | CaO of blood serum... 0.014 |
| Dog VI. | CaO of bile.. 0.056 | CaO of blood serum... 0.017 |

†In every instance where calcium is referred to in quantitative terms calcium oxide is meant.

‡Naunyn, Klinik der Cholelithiasis, p. 15, 1892.

*From 1 to 2 grams of calcium chloride were introduced in this way.

The view expressed by Gilbert that the biliary calcium is largely derived from the mucous membrane of the gall-bladder through its mucous and desquamated epithelium is probably in large part correct. The acid mucin is probably combined with calcium when it passes the mucus from the mucous glands into the cystic bile or into the hepatic bile. One would therefore anticipate that whenever there arises a catarrhal inflammation of the gall-bladder the conditions would become favorable for an increase in cystic calcium and hence for a precipitation of calcium salts. But so far as I am aware careful experimental data relating to this point are lacking.*

An excessive concentration of the biliary calcium is probably answerable for the deposition of salts of lime, especially calcium carbonate and calcium phosphate. Calculi containing such salts in abundance are sometimes found in cattle, and foreign bodies in the human gall-bladder may undergo incrustation with calcium salts. In true human gall-stones, however, the inorganic combinations of calcium are of less significance than the unstable and comparatively unstudied organic compound known as bilirubincalcium.†

The conditions under which bilirubincalcium separate from the human bile to enter into the composition of calculi are only imperfectly understood and deserve painstaking study, since bilirubincalcium is so common a constituent of gall-stones. Naunyn showed that mere concentration of the bile, at least in the case of dogs' bile, does not suffice to bring about the separation of bilirubincalcium. Observations already referred to in this paper render it improbable that increased concentration of calcium salts necessarily occasion precipitation. If other conditions are operative separation may occur when the calcium content of the bile is not excessive. This inference seems to be justified by the fact that one may discover bilirubincalcium in the sediment of human bile in the absence of an unusual percentage of lime. An important factor in favoring precipitation is the reaction of the bile. A pronounced alkaline reaction to litmus facilitates separation. Still we do not know how frequently this factor comes into play in the production of human biliary calculi. Finally, it is known that the presence of proteids may exert a powerful effect in determining a deposition of bilirubincalcium from the bile. Variations in the biliary proteids may thus come to assume importance for the pathogenesis of calculi. It belongs to future investigations, however, to establish the conditions under which the proteids of the bile play a part in causing the precipitation of bilirubincalcium. It seems not improbable that this precipitation will be shown to depend on the cooperation of several variable influences, the efficacy of a single factor, such as alkalinity, being commonly dependent on associated conditions.*

*Relation of Bacteria to Gall-stone Production.*—It has been shown that the chief constituents of gall-stone, cholesterin, and bilirubincalcium, have their origin in local alterations of the mucous membrane of the gall-bladder involving desquamation of epithelium on the one hand, and probably an increased production of mucus by the mucous glands, on the other. Hence it is appropriate to inquire into the causes of these local alterations, which are the common accompaniments of cholecystitis.

*Bacterial Origin of Cholecystitis.*—Modern studies make it clear that the various forms of cholecystitis are in almost all instances of bacterial origin. The chief inciters of the inflammatory process are *Bacillus coli communis, Staphylococcus albus, Staphylococcus aureus, Streptococcus pyogenes, and Bacillus typhosus.* Frequently one type of organism is obtained in pure culture from the bile, but at times two or more varieties are found in association. The character of the alterations in the walls of the gall-bladder and in the bile depend on the nature of the organisms and their degree of virulence. The chemical characters of the bile, as influenced by these different conditions, have not yet received the attention they deserve. Some characteristic relations have, however, been noted, which are worthy of mention. Thus the cystic bile in the typhoid infection of the gall-bladder, so commonly found in typhoid fever, is increased in amount, watery, dirty brown in color and contains an abundance of epithelial cells and epithelial detritus. A mild cholecystitis is present in such cases although it commonly happens that there are no distinct symptoms referable to the gall-bladder. The occurrence of so much desquamated epithelium is suggestive of a rich source of cholesterin, and it would be well worth while to actually determine the cholesterin in a series of such typhoid biles.

The relation of cholecystitis to gall-stone formation is strikingly shown by a table of 32 cases of typhoidal cholecystitis compiled by Ehret and Stolz ‡ which were either subjected to autopsy or came to operation. In 20 of these 32 cases gall-stones were present! This is of course a very high proportion as compared with the percentage observed in autopsies made at random on persons of the same age and sex.‡

From what we know at present of infectious cholecystitis it is safe to say that such processes

*This point can probably be settled experimentally by means of poisoning by toluylendiamine, since this substance markedly increases the mucus of the bile, even in the small hepatic ducts.

†Bilirubincalcium can be precipitated by the addition of calcium chloride to an ammoniacal bilirubin solution. It forms a rust-colored flocculent deposit which has a metallic green luster when dried over sulphuric acid. It is a definite compound, in which bilirubin behaves like a monobasic acid, and is represented by the formula $(O_{16}H_{17}N_2O_3)_2$ Ca. It is insoluble in water, alcohol, chloroform and ether. A corresponding sodium compound can be prepared.

*It is said that the presence of bile salts tends to prevent the combination of bilirubin and calcium (Brockbank). Another factor which may influence precipitation is the quantity of bilirubin in the bile. It is especially desirable that the influence of mucin and of albuminous inflammatory exudates should be studied.

‡Experimentelle Beiträge zur Lehre von der Cholelithiasis Mitt. aus der Grenzgeb. der Med. u. Chirurgie, Bd. VII, 2. and 3. Heft, S. 372.

‡It is noticeable that the average age of these patients with typhoid cholecystitis is less than twenty-eight years.

afford conditions favorable to the production of cholesterin and mucus in excess, although we do not yet know under precisely what conditions their overproduction is most likely to happen. It seems probable from experimental data that infections of a moderate or slight degree of virulence are most likely to result in conditions favorable to gall-stone production, a supposition which accords well with the frequent absence of a history of acute cholecystitis preceding symptoms of gall-stone colic.

*Occurrence of Bacteria in Gall-stones.*—It has now come to be generally admitted that a large proportion of gall-stones from the human subject contain bacteria in their centers, sometimes living, sometimes uncultivable. M. Galippe* apparently deserves the credit of initiating the investigations which have led to this important conclusion. In 1890, about four years after the publication of Galippe's first paper, Welch found the *Bacillus coli communis* and the *Staphylococcus pyogenes* in gall-stones and since that time the subject has been studied by Gilbert and Dominici,† Gilbert and Fournier,‡ Hanot,§ Létienne‖ and others. The *Bacillus coli communis* and the typhoid bacillus have been the organism most frequently found.¶

No careful and extended studies have yet been made with a view to determining whether there is apt to be a relationship between the nature of the bacteria derived from gall-stones and the chemical constitution of the stones. There is some reason to think that pure cholesterin stones are often associated with a nucleus which contains colon bacilli, and it has been claimed that the *Streptococcus pyogenes* is apt to be associated with stones rich in calcium salts.

*Experimental Production of Gall-stones.*—The mere presence of pathogenic bacteria in the centers of gall-stones, though a fact of much interest, is far from being a proof of the micro-organic origin of biliary calculi. If, however, it could be shown that the experimental introduction of such bacteria into the gall-bladder, under suitable conditions, is often followed by the formation of gall-stones hardly distinguishable from human calculi as regards constitution and bacterial contents, this would constitute an indestructible prop to the doctrine that bacterial infections lead to the production of calculi. Efforts to induce gall-stone formation in this manner were for a long time unrewarded by success. In 1897, however, both Gilbert and Fournier* and Mignot† reached the important goal for which they had striven, and obtained definite calculi by infecting the gall-bladder with the *Bacillus coli communis.*‡ It was soon afterward shown that true biliary calculi very closely resembling those found in human gall-bladders, as regards form, color, stratification and bacterial contents, can be experimentally induced through infection with *Bacillus typhosus.*

This result is of the first importance to gall-stone pathology, for it has brought a knowledge of the leading conditions requisite for the production of calculi through infection.

*The Conditions of Calculus Production From Infection.*—(*a*) Degree of Virulence of Micro-organisms. The mere introduction of virulent micro-organisms into the gall-bladder of an experimental animal does not usually suffice to induce gall-stone formation. Such organisms generally set up an acute cholecystitis and the very severity of the process defeats the desired end by causing destructive or atrophic alterations in the mucous membrane of the gall-bladder, that lead to interferences with the continued overproduction of cholesterin underlying calculus formation.

If, however, the infective agent be first attenuated in virulence, as suggested and practised by Mignot, the chance of inducing stone formation is very greatly increased. This is apparently for the reason that bacteria attenuated in virulence set up a subacute cholecystitis peculiarly favorable to the establishment of cholelithiasis. A further precaution which helps to insure success in causing experimental cholelithiasis is the cultivation of the bacteria employed, in diluted bile, during several weeks before their introduction unto the gall-bladder. This procedure appears to facilitate the adaptation of the bacteria to the normal bile, by which they secure a permanent foothold in the gall-bladder.

As to the kind of organisms capable of inducing gall-stones Mignot's work shows that *Bacillus coli, Bacillus typhosus, Staphylococcus pyogenes, Streptococcus pyogenes* and even *Bacillus subtilis* may each be successfully employed as inciters of gall-stones. But their degree of virulence appears much more significant in this connection than the variety of micro-organism. (*b*) Retention of Micro-organisms in the Gall-bladder. It is obvious that an essential condition for experimental gall-stone production is the retention of the living infective agents within the gall-bladder. Two natural defenses of the normal organism are constantly opposed to the es-

*Galippe's very suggestive paper is entitled Mode de Formation du Tartre et des Calculs Salivaires: Considérations sur la Production des Calculs en général; Présence des Microbes ou de leur germes dans les Concrétions (Journal des Connaissances Médicales, 25 Mars, 1886).

†La Lithiase biliaire est-elle de nature microbienne? (Soc. de Biol., 16 Juin, 1894.)

‡Du role des microbes dans la genèse des Calculs biliaires (Soc. de Biol., 8 Février, 1896).

§La Fièvre typhoïde et lithiase biliaire (Bull. Méd., 22 Janvier, 1896).

‖Calculs pariétaux de la vésicule biliaire (Congrès de Médicine tenu a Bordeaux, aout, 1895, et Médicine Moderne, 17 aout, 1893).

¶Only intact calculi should be bacteriologically studied as the lightest abrasion permits the entry of intestinal bacteria. Calculi covered with a pigmentary stratum are impervious to bacteria, but pure cholesterin stones, without such protection, are liable to permit the invasion of intestinal bacteria after death.

*Gilbert, A. Note pour servir à l'histoire de la theorie microbienne de la lithiase biliare, Archives Générales de Médicine, Vol. II, p. 257, Septembre, 1898. Gilbert was put on the path leading to success through observing in conjunction with Dominici (Angiocholite et cholécystite typhique expérimental, Comptes Rendus de la Soc. de Biologie, 23 Décembre, 1893, p. 1033) in 1893, that little concretions ("petites concrétions verdâtres") formed in the gall-bladder of a rabbit with typhoidal cholecystitis. After this methodical attempts were made to obtain more typical concretions.

†Reported at the Société de Chirurgie, May 19, 1897. See Hartmann, M. H., Pathogénie de la Lithiase, La Presse Médicale, No. 10, 2 Mars, 1898, p. 111.

‡The priority in this work belongs to Gilbert, although Mignot made the first public announcement of his results. See Cushing, Johns Hopkins Hospital Bulletin (Nos. 101 and 102) p. 168, 1899. Cushing, Richardson and Lartigau, in this country, have each succeeded in producing calculi by infecting the gall-bladder.

tablishment of bacteria in the gall-bladder. One of these depends on the fact that the bile (at least in the case of dogs) is a poor medium for the multiplication of certain kinds of bacteria and when fresh is not in general an ideal basis for bacterial growth. While it is very doubtful whether even quite fresh bile has any antiseptic action the relatively slow multiplication of intestinal bacteria in this medium (as compared, for instance, with bouillon) during the first hours after infection, must operate as a protection against injury from micro-organisms, provided the bile has a free exit and is not permitted to remain many hours in stagnation. In health there is a free exit both for the cystic and the hepatic bile and the normal bile current into the duodenum is such as to constitute a most effective defense against the domicile of bacteria within the bile-passages. It is easy to satisfy oneself of the importance of this normal bile outflow by injecting bacteria of moderate virulence into the gall-bladder, where they fail to gain a foothold. The outcome is, however, greatly altered if one first ties the cystic duct or detains the micro-organisms by means of foreign bodies to which they cling. Mignot made effective use of the latter method. In one set of observations these foreign bodies, impregnable with the bacteria to be tested, were permitted to sojourn in the gall-bladder during the entire period covered by the experiments. In another series the foreign bodies were removed by operation after a lapse of three or four weeks, during which time the bodies were operative in keeping bacteria in contact with the mucosa, thus facilitating the establishment of a cholecystitis. In both sets of observations the animals were killed after four or five months and the gall-bladders were found to contain concretions comparable with human calculi, chemically, physically and bacteriologically. Some of the stones resembled the pure cholesterin stones of man. A few contained some sodium chloride and some bile-acids and bile pigments.

*The Influence of Foreign Bodies.*—The observation that various foreign bodies* have occurred in the centers of human gall-stones has led some writers to attach considerable importance to these accidental inmates of the gall-bladder, as inciters of stone production. If, however, we leave out of consideration the epithelial masses (which cannot be classed as foreign bodies) and the masses of bacteria so often discovered at the centers of gall-stones, definite foreign bodies are rare constituents of calculi. Nevertheless it is interesting to consider for a moment what influence foreign bodies have upon the separation and crystallization of the constituents of calculi. It is certain that sterile glass beads and similar bodies can be left in the gall-bladder of an animal for many months without occasioning the formation of any concretions.† This negative result can not, however, be interpreted to mean that foreign bodies are always without influence upon the production of calculi, for it is undeniable that just in so far as they interfere with the complete expulsion of the cystic contents do they favor the accumulation of micro-organisms in the gall-bladder. In this way human gall-stones may become operative in facilitating reinfection of the gall-bladder at any time after the death of the bacteria to which they owe their birth. It is interesting that even a stone with a smooth surface facilitates the retention of bacteria in the gall-bladder on account of the layer of fluid which clings to their surface owing to the operation of capillary attraction. Porous stones one would expect to be even more effective owing to their impregnation with bacteria.

*The Influence of Mechanical and Chemical Irritants.*—Experimental damage to the walls of the gall-bladder by heat (cauterization), scratching, and the application of silver nitrate was found by Myake to be without influence in causing infection. The bile remained sterile in all experiments of this kind. In my laboratory we have had a similar experience with injections of mercuric chloride. These results are, of course, no evidence that chemical irritants causing an excess of cholesterin in the bile might not in time lead to the production of gall-stones even in the absence of infection. On the other hand, there is at present no unimpeachable evidence for the view that stone formation occurs independently of infection, where the stone-forming elements of the bile are increased.

*The Micro-organisms of Normal Bile.*—The not inconsiderable literature relating* to the bacteriological examination of the normal bile of dogs, rabbits and guinea pigs indicates that in a majority of instances the bile is sterile, at least so far as can be judged by the ordinary methods of examination, in which small quantities of bile are employed in making cultures. Observations made at my suggestion by Mr. L. F. Rettger are in harmony with this view. Rettger made cultures from the bile from six normal dogs, with negative results in every instance. Smears made with the bile taken from the gall-bladders of 32 normal pigs showed growths in only three instances.† That the bile of guinea pigs and of rabbits is ordinarily free from pathogenic organisms is made probable by experiments of Fraenkel and Krause,‡ in which they snipped the gall-bladders and permitted the bile to run into the peritoneal cavity without causing infection.

These various results cannot be regarded as absolute proof that the bile is strictly sterile in most instances, for it was found by Ehret and Stolz that the contents of the gall-bladder was

*Among the bodies noticed have been silk and metal ligatures, globules of mercury, a pin, clots of blood, etc.

†See Ehret and Stolz, also Mignot. A sterile silk thread may in time become encrusted with calcium salts, although the bile remains sterile, but it is doubtful if foreign bodies ever lead to a precipitation of bilirubin or cholesterin.

*Zur experimentellen Erzeugung der Gallensteine mit besonderer Berücksichtigung des bakteriellen Verhalten der Gallenwege, Mitt. aus der Grenzgeb. der Med. u. Chirurgie, Bd. 6, 4. and 5. Heft, S. 479, 1900.

†In one case the colon bacillus, in a second the colon bacillus and an unknown coccus, in the third case one unidentified bacillus, probably a member of the colon group.

‡Fraenkel and Krause, Zeitschrift für Hygiene, Bd. 32, 1899, pp. 77 to 110.

infected in almost one-half the animals examined by them. These observers made their cultures with relatively large quantities of bile, thus increasing the chances of discovering bacteria. It may be safely stated, however, that the bile of normal dogs, pigs, rabbits and guinea pigs commonly is sterile or contains very small numbers of bacteria (usually members of the colon group).

Very similar conditions prevail in the case of human bile studied at autopsy. Although most of the patients examined by Fraenkel and Krause had died either of acute infectious diseases or with tuberculous lesions, the bile was sterile in 105 out of 128 examinations from the same number of patients.

It is notable, however, that although the bile of 34 out of 36 tuberculous patients was sterile by ordinary culture methods, the bile excited tuberculous lesions in 5 of the 11 guinea-pigs into which injection of the bile was made. It is thus not unlikely that micro-organisms are present in human bile more often than one might suppose from the results of cultures made with single supplies of bile. Even the bile of normal persons may be more often infected than has usually been supposed, but the organisms are probably neither numerous nor virulent in the majority of instances.

*Frequency of Human Biliary Infection in Disease.*—It is a well-established fact that even in the absence of cystic disease bacteria are likely to be present in human bile when there exist pathological conditions in parts remote from the gall-bladder. The *Bacillus coli communis* and the *Staphylococcus* are among the most common inhabitants of the bile under these circumstances. Other pyogenic cocci, including the *Pneumococcus*, are probably much less often present in the gall-bladder, at autopsies made at general hospitals on patients who have not had gall-bladder disease.

Some kinds of infective agents are easily missed, on account of the difficulty in making them grow on ordinary media. This is certainly true of the *Pneumococcus* and the experience of Fraenkel and Krause with the *Bacillus tuberculosis* makes it likely that this organism is often overlooked. On the other hand the presence of bacteria in the bile at autopsy is frequently to be regarded rather as the evidence of a terminal infection than as the expression of an earlier invasion.

(To be Continued.)

**Banti's Disease.**—A case of the peculiar symptom-complex known as Banti's disease, developing directly after a severe trauma to the splenic region, is reported by D. Fichtner (Münch. med. Woch., Aug. 11, 1903). The view that the condition is only a manifestation of hereditary, tardy syphilis is gaining more and more ground, though it is often hard to obtain a history of syphilis in the parents and the patients only rarely show other signs. The author's case presented all the typical symptoms and in addition, went through a facial erysipelas complicated by a suppurative otitis media.

## THE MODERN TREATMENT OF THE ACUTE SUPPURATIONS OF THE KNEE-JOINT.

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Etiologically, the acute purulent inflammations of the knee-joint can be divided into three groups. To the first belong the metastatic suppurations observed in infants shortly after the detachment of the stump of the cord, and in women during the puerperal period. But they are not rare in any form of pyemic fever, be its cause otitis media, or osteomyelitis or gonorrhea, or in fact, any conceivable order of suppuration, in which septic thrombi become detached and are carried into the portal or systemic circulation.

The second group is composed of cases in which the purulent infection of the joint is due to a direct perforative extension of the pyogenic process from an adjoining focus of suppuration as of an acute or chronic osteomyelitis.

The third group contains cases in which the septic infection is carried to the joint by a penetrating traumatism, laceration, stab, incision, or gunshot, either directly into the main articular space, or indirectly, through one or another of the accessory synovial bursæ. Such are the quadriceps bursa, the bursæ found underneath the semimembranosus, and those of the popliteal space, most of which have an open communication with the knee-joint.

We observe remarkable differences in the destructiveness and virulence of the various forms of acute pyarthrosis. The metastatic suppurations have the mildest character. Next in virulence stand the suppurations communicated from an adjoining focus of infection. The most dangerous are those due to traumatic infection. While in these, by the intense sepsis, limb and life of the patient are placed in jeopardy; the former, unless neglected, will rarely do other lasting damage than a more or less complete disability of the joint.

When the initial sepsis does not destroy the patient's life, and no steps are taken to relieve the process by surgical measures, we see that the thickened and congested synovial capsule will be eroded and perforated. With this a certain quantity of the septic contents of the joint will escape into adjoining areolar spaces, and the enormous intra-articular tension being somewhat relieved, the local and general symptoms will show a certain abatement. But this improvement is temporary only, lasting not longer than the time required for the tense repletion with pus of the secondary abscess or abscesses. These, in turn, will break down intervening barriers, the suppuration extending along the lines of least resistance upward into the thigh, or downward, following the areolar planes of the muscles and tendons of the leg.

Exceptionally, when the perforation of the synovial membrane corresponds to the anterior or lateral aspects of the joint, where the abscess becomes at once subcutaneous, the integument may

be perforated also. Thus a short fistula may be established, leading directly into the joint cavity.

But the destructive action of the septic process is not limited to the capsule alone; it involves the cartilaginous joint surfaces also. These become discolored, roughened, and separated from the underlying epiphysis in the shape of smaller or larger irregular tatters. This loss of the articular cartilages is the cause of the subsequent anchylosis.

The diagnosis rests mainly upon the proof of the facts, that the joint is distended by an exudate, and that the distending material is pus. We need not dwell upon the physical signs of distention of the knee-joint. The change from the normal shape of the joint to that characteristic of a distended joint, the presence of fluctuation and of ballottement of the patella will suffice. Where such distention is accompanied by intensely septic general symptoms of growing severity—even to the so-called typhoid status—when, at the same time, the local disability, tenderness to touch, the exquisite pain and the edema of the integument all point to a destructive process, the crucial question of "pus or no pus" should be immediately put by means of the aspirating needle.

Errors of diagnosis are rare in pyemic or in traumatic cases, more common, however, when the joint suppuration is due to perforation from an adjoining focus of acute osteomyelitis. Of diagnostic errors that have come under my personal observation, that of acute articular rheumatism was the most frequent one, then followed cerebrospinal meningitis, and finally typhoid fever. A careful and systematic going over of the whole body of the patient, especially when he is more or less comatose, will soon establish the presence of the characteristic, pale and deep-seated edema of the lower end of the femur or of the upper end of the tibia. Pressure over the epiphysial line will not fail to elicit signs of distress, even in a deeply comatose patient, and the practitioner, if his diagnosis be made early, will at this stage find no abnormality about the joint.

Let us now enter into a separate study of the three groups above defined.

*1. Metastatic or pyemic suppuration.*—Ordinarily the onset of this trouble is mild, its course inclined to be chronic. The local symptoms are not very salient and are often obliterated by those of the general condition, so that they may be overlooked both by patient and physician. Occasionally, however, they will be very acute and obtrusive. The mildest infantile forms show even a tendency to spontaneous cure, and ought not be meddled with. They occur frequently during and after puerperal fever, accompanied by purulent collections in other joints, and as before mentioned, in the new-born, at the time of the separation of the umbilical cord. If the local symptoms are troublesome they will demand surgical interference. First evacuation by puncture, and if the collection be ropy and thick, by irrigation. Rapid reaccumulation will demand incision and drainage. The number of incisions must depend upon the acuteness of the local symptoms. In mild cases two lateral incisions, placed along the sides of the patella, and a median incision penetrating the quadriceps bursa will be found sufficient. A rubber tube is placed into each one, and the dressed limb is fixed on a suitable splint, preferably in horizontal suspension. Daily change of dressings and irrigation will follow. As soon as the secretion becomes serous, the tubes ought to be withdrawn. In small children, one, or at most, two incisions will suffice, and here the use of carbolic solutions is strictly to be shunned on account of their highly poisonous influence. In infants, the function of the joint is commonly restored, but this is not exceptional in puerperal cases, especially when they have received prompt and adequate attention. One of the most troublesome forms of metastatic infection of the knee-joint is that due to gonorrhea. Ordinarily it appears in the shape of gonorrheal rheumatism; the places of predilection being the wrists and the knee-joints. The exudate is rarely copious, and the lack of harmony between the moderate physical signs and the exquisite painfulness one of the paradoxes of surgical experience. Only those cases will require active interference in which massive effusion and great tension threaten the integrity of the joint. The course of the malady is very slow and rebellious, but in the majority of cases, the function is restored.

*2. Suppuration due to osteomyelitis.*—Osteomyelitis is eminently a disease of adolescence, being most frequent in the years just preceding puberty. In the lower extremity the place of predilection is the neighborhod of the knee-joint, or more precisely, the lower epiphysial line of the femur, or the upper one of the tibia. In children, the epiphysis itself does not represent a great mass, and, therefore, it is not rare, that having become the seat of osteomyelitis the process extends to the epiphysial cartilage. For a short while this acts as a barrier against the spread of the infection; but as soon as the necrosed part of the cartilage is loosened and flakes off, pus pours into the opened joint and we have to deal with a suppurative gonitis complicating the osteomyelitis. This is the most common form of causation.

At other times, the osteomyelitis having produced an abscess involving the soft parts of the extremity, this abscess, especially when situated in the popliteal space, may perforate into one of the popliteal bursæ which freely communicate with the joint; or, a direct perforation from without inward may occur through the synovial capsule. In all these cases the osteomyelitis must have existed for some time, the involvment of the knee-joint being a late complication. On the other hand, where the osteomyelitic focus penetrates directly into the joint, we see the symptoms of acute osteomyelitis and of acute gonitis compounded and overlapping. In every case of osteomyelitis attacking the tibia or femur near the knee, it will be the duty of the practitioner to watch the joint and not to overlook an effusion

distending it. But the edema of the integument caused by the osteomyelitis, should not be mistaken for an effusion, which must present the classical signs of fluctuation and ballottement. Flexion and rigidity of the joint, being regular companions of osteomyelitis, have also an inferior diagnostic significance.

According to modern ideas, every osteomyelitic focus ought to be freely opened as soon as the diagnosis is made. A free external incision will expose the bone, and the chisel and mallet will lay open the diseased medulla and cancellous tissue. Thus, in favorable cases, the extension of the infection to the articular cartilage may be averted. But where the joint has been attainted, the osteomyelitic focus ought to be followed up and traced to where it perforated the cartilage. To this should be added at once arthrotomy.

In speaking of the treatment of the pyemic forms of gonitis, we have already mentioned the methods of multiple arthrotomy found to be adequate in that class of cases. Experience had taught us, that in virulently septic gonitis two lateral incisions, supplemented by an incision into the quadriceps bursa, did not afford effective drainage. And this is easily understood if we consider the irregular and sinuous conformation of the knee-joint. Hence we saw that Andrews, of Chicago, proposed to make five drainage apertures; one into the quadriceps bursa, two laterally above and two below the patella. Sometimes this proved to be adequate, often, however, insufficient, and the author of this paper, together with other surgeons, sought to render drainage still more perfect by entering the joint posteriorly, through the popliteal cavity, that is at its most dependent portion. The exposure of the capsule in this region, demanded, of course, on account of the popliteal vessels, careful preparatory dissection. This also was found to be unsatisfactory, the reason being, first, that the infection did not concern the surface of the synovial membrane alone, but involved its entire thickness, together with more or less of the underlying tissues; and, secondly, that drainage and irrigation of the complicated joint cavity could never be made perfect by means of multiple incisions.

Mayo, of Rochester, Minn., finally proposed and successfully employed a radical procedure, possessing the greatest value, and which has been deservedly accepted by the surgical fraternity. It consists of the transverse incision of the infected knee-joint, passing from condyle to condyle just above the patella, and, of course, dividing the quadriceps tendon. Ollier, the French surgeon, supplemented Mayo's incision by advising the extirpation of the crucial ligaments.

The advantages of Mayo's incision are manifest. The joint having been widely opened along three-quarters of its circumference, direct access to all its recesses becomes easy, especially if the crucial ligaments be also divided. Each of the sinuosities of the capsule can then be inspected and subjected to direct local treatment by packing. To do this thoroughly, the knee is flexed to an angle of 45°, and after due packing is dressed in this position. Experience has taught us the great advantage of this treatment over irrigation, even if permanently employed. The contact of the medicated packing with the diseased capsular tissues favors profuse exudation, by which they are rapidly depleted of infectious matter. Ordinarily, the local and general septic symptoms rapidly subside, and within a week or ten days, the flexed joint can be again extended, in which position it is permitted to heal. Where most or all of the articular cartilage was preserved, even a certain degree of the function of the joint may be regained. Extensive loss of the cartilages, however, must end in firm anchylosis.

Experience enables me warmly to recommend Mayo's incision, where the virulence of the infection threatens the loss of the patient's limb and life. To illustrate its effect, the history of a typical case may here be quoted.

Yette G., thirteen years old, admitted April 8, 1902, to Mt. Sinai Hospital. Two weeks before admission she sustained, by a fall, an injury to the left lower extremity. Ever since then she was unable to walk. During the last four days she has had a number of severe chills followed by high fever. On admission considerable swelling extending from the hip to the knee was found, which was rigidly flexed. The joint, especially the quadriceps bursa, was much distended and exquisitely painful, the patella floating, and marked tenderness was observed along the lower epiphysial line of the femur. Temperature, 104° F., pulse 130. The diagnosis of acute osteomyelitis with involvement of the knee-joint being made, an immediate operation was decided upon. Aspiration of the knee-joint yielded pus. It was laid open by a transverse incision extending from epicondyle to epicondyle, and dividing the ligamentum patellæ. A large amount of thick pus was evacuated. The synovial membrane was found to be very edematous, with a reddish brown discoloration, the articular cartilages smooth and yellowish in color. The quadriceps bursa was also distended with pus, its synovial lining edematous and hemorrhagic. After a thorough cleansing and packing of the joint cavity, the lower extremity of the femur was exposed by an external longitudinal incision. The periosteum having been raised, the medullary cavity of the shaft and the cancellous tissue of the epiphysis were exposed by a fenestrum made with the chisel and mallet. In a well-defined area, they were found to be filled by pus and liquid fat. Spreads of the pus contained staphylococcus. This purulent area was removed by means of a scoop, and the resulting cavity was packed. The limb was dressed in the flexed position. Immediately the temperature and pulse rate began to descend, slowly but steadily. The dressing became rapidly permeated by a copious sanguinolent discharge, and its external portions had to be changed very frequently. By April 13 the morning temperature had fallen to 100° F., the evening temperature being 102° F.; the pulse about 100. The

deep dressings were then changed. The synovial membrane presented a clean, granulating surface, no retention was present. The osteomyelitic cavity also showed healthy granulations. The limb was extended, and the recesses of the knee-joint as well as the bone cavity were lightly packed, after which the extremity was fixed upon a dorsal splint. April 19 the flap containing the patella was sutured back into its normal position. By the end of April all the febrile symptoms had disappeared, and the cavities began to close up. June 30, all the wounds were healed, and mobility of the joint began to assert itself within an arch of 10 degrees. Presumably this would increase in due course of time. July 5 she was discharged cured. Walks well and is in an excellent general condition.

In my student days, along the late sixties of the past century, an acute septic suppuration of the knee-joint was considered as one of the fixed indications for amputation of the thigh. The excellent results of Mayo's incision have certainly helped to restrict the scope of this indication more than any previously known measure, but have not obliterated it completely. The following history will prove the fact:

Elsie L., twelve years old, admitted to Mt. Sinai Hospital, November 1, 1901. Nine days before this she had a fall, injuring her right leg, but was able to walk home. Two days later severe pains set in at the right knee with repeated chills, very high fever, much vomiting and great prostration. On admission we found her internal organs normal, right knee was rigidly flexed, but showed no signs of distention. The upper end of the tibia was the seat of a considerable amount of deep-seated edema. Fluctuation was also made out. The integument was pallid and shining. This edematous area was the seat of excruciating pain and extremely tender to the touch. Temperature, 104.2° F., pulse 140. The patient was immediately anesthetized, and the external abscess was widely opened. A ragged opening in the periosteum was found to lead into a large subperiosteal cavity extending downward to the middle of the tibia. The periosteum being raised, the chisel and mallet exposed the interior shaft and upper epiphysis of the tibia, which was filled with pus. The epiphysial line showed beginning purulent separation. Drainage of bone and external abscess and fixation of limb. Culture of the pus yielded staphylococcus. An immediate improvement of the general condition followed, though the patient continued to be feverish in the evenings. On November 16 the temperature rose to 103° F. An effusion appeared in the knee-joint, which, on aspiration yielded turbid synovial fluid. A thick trocar was inserted, and the joint was thoroughly irrigated with saline solution, then flushed with a 5-per-cent. solution of carbolic acid, and again washed with salt solution. For a few days the fever subsided somewhat, but soon became high again. The knee remained excessively painful. The tibial shaft showed a good tendency to granulate, but the epiphysis threatened necrosis. This led us to expect its perfect detachment, which became evident by Nov. 30. The child began to look markedly septic and aspiration of the knee yielded thick pus. Consequently, the joint, being incised according to Mayo, a certain quantity of pus was liberated. Three perforations of the articular surface of the internal tuberosity of the tibia were found. The quadriceps bursa also was distended by pus and had to be incised. The necrosed portions of the epiphysis were removed by means of the gouge, all the cavities were packed, and the limb put up in flexion. These steps were also followed by a passing and short improvement, but the gradual and complete necrosis of the epiphysis could not be arrested. The continuous fever, the copious discharges and the pain began to sap the strength of the patient, her liver enlarged, the pulse became very rapid and feeble, hence, to save her life, on Jan. 7, 1902, amputation in the middle of the thigh was done. Patient was discharged cured on Feb. 19, 1902.

Chronic ulcerative osteomyelitis, the common sequela of acute osteomyelitis, may also lead to perforation of the articular cartilage and to acute suppuration of the knee-joint. In one of the writer's cases (Wm. Kaplan, admitted May 10, 1898), this accident occurred ten years after the first attack of the acute disease. Originally a large sequestrum of the femur was extracted. The wound healed, and limb remained sound for five years; then, within the last five years it was operated upon for relapses four times, all involving the epiphysis, of which finally not more than a shell was left behind. May 13, the fifth time the cavity in the epiphysis was curetted. On May 30 suppuration of the knee-joint became manifest. June 2, Mayo's operation was performed. The articular cartilage was found to be extensively necrotic, together with the underlying remnants of the epiphysis. It became evident that the limb would be useless after the loss of the entire epiphysis. And as its remnants continued to necrose, this process maintaining an exhausting septic fever, amputation was done on June 23. On July 23 patient was discharged cured.

*3. Traumatic Suppuration.*—The author's first acquaintance with this dreadful form of infection was made in 1878. The patient was an old lady of about seventy years, who was much annoyed by a swelling occupying the inner aspect of one of her knees. The family attendant, an enterprising young practitioner, had correctly diagnosticated a chronic inflammatory distention of the bursa found underneath the semimembranosus tendon. In those days Fergusson's surgery was one of the accepted text-books, and our confrère went to this author for guidance. Fergusson recommended for curing bursitis or a ganglion, the drawing of a *seton* through the offending sac. For 36 hours the seton had caused little trouble, but then the bursa became infected, and rapidly the contamination spread to the knee-joint, with which the bursa had an open communication. The present writer stepped into the case at this stage of the malady, finding a thoroughly septic old

woman suffering from far gone arteriosclerosis and a fatty heart, having albumin, casts and sugar in her urine, the knee-joint distended with pus, the pulse rate and temperature very high, the patient failing. Incisions, irrigation and drainage were immediately resorted to, but without avail. The synovial lining of the joint was found extensively necrosed, and the patient succumbed within forty-eight hours after the onset of the gonitis, under the symptoms of combined sepsis and diabetic coma.

It may be justly remarked, that in this instance senile decay, chronic nephritis and the diabetes had as much to do with the fatal issue as the infection. But the following histories will demonstrate that traumatic infection of the knee-joint is a terrible enemy even under the most favorable conditions of general health.

Mrs. Alice H., thirty-eight years old, a butcher's wife, admitted March 14, 1897. Forty-eight hours before admission she fell, while holding an open penknife in her hand, and the narrow blade of the knife penetrated the knee-joint, from which synovial fluid had since then been escaping. She tied a wet rag to the knee, and went about her business. Six hours after the accident the joint became painful and a furious chill and high fever set in. When seen by the writer the joint was distended to the utmost. Just above the patella and corresponding to the internal margin of the quadriceps tendon an incised wound of about one-sixth of an inch in length could be observed. Its margins were reddened, swollen, and from the patulous orifice purulent synovial fluid was escaping at the slightest pressure. The temperature was 103.4° F., the pulse 120; the general signs were those of a profound sepsis. The tongue had become dry and was covered with a brown coating, the patient was somnolent, and vomited most of what she had unwillingly swallowed, and the expression of her face was indicative of great prostration. She was immediately sent to the hospital, where the joint was incised and drained. Two lateral incisions were placed above, two below the patella, and a fifth one directly into the quadriceps bursa. The limb was placed in suspension on a dorsal splint, and the drainage tubes were connected with two irrigators filled with Thiersch's solution, which was passing in a steady, slow stream through the joint. These comprehensive measures had not the slightest effect upon the general condition of the patient, who became profoundly comatose, her temperature rising to, and remaining above 105° F. The heart began to show signs of failure in spite of energetic stimulation. During March 15 30 cubic centimeters of streptococcus antitoxin were injected in three equal doses every six hours, without the slightest appreciable effect. March 16 the urine became loaded with albumin, hyaline and granular casts. A copious saline infusion and another administration of antitoxin did not retard the patient's death, which took place at about midnight; that is just four and a half days after the injury. The entire synovial membrane had become necrosed, and it is very doubtful that Mayo's incision could have changed the issue.

More successful than in the preceding two cases was the application of Mayo's incision in the following instance. The events of the case, while demonstrating that the character of the infection was not of an excessive virulence, yet illustrates the many difficulties the surgeon may have to overcome in bringing the trouble to a successful termination:

Isidor R., nine years old, admitted Aug. 27, 1899. Having been, eleven days ago, accidentally thrown off a car, his right knee was cut. Immediately afterward a practitioner had sewed up the small wound. The second day after the injury he vomited, the third day great swelling of the knee with excruciating pain, a severe chill and high fever set in, whereupon the stitches were removed. Since then a number of rigors had occurred, and the patient was sent to Mt. Sinai Hospital. We found a deeply prostrated boy, his temperature 103°F., pulse 140, with the facial expression of collapse, the entire right thigh enormously swollen and abnormally indurated. On the external aspect of the knee a granulating linear and patulous wound was seen, from which pus was oozing and through which a probe readily penetrated into the knee-joint through a rather narrow sinus. The joint was much distended by pus. Immediately the house surgeon, Dr. Allen, opened the joint by Mayo's incision. The entire capsule was found to be sloughing and most of it was excised. The cartilages looked normal. After packing the wound the limb was put up at an acute angle. The next day the fever was still very high, the thermometer indicating 105.6° F. The boy was anesthetized, and the packings being removed, it was ascertained that no retention was present in the joint itself. The swelling of the femur not having subsided, the suspicion of osteomyelitis became confirmed and was verified by the subsequent events. The cartilages became gradually separated and sloughed off, and a number of periarticular abscesses, both of the leg and of the thigh formed, and had to be opened one after the other. For each of the many changes of the dressings, the boy had to be anesthetized with chloroform. He bore the anesthetic excellently, and the manipulations could thus be done rapidly and smoothly. Portions of the epicondyles of the femur as well as parts of the head of the tibia necrosed and were gradually cast off. By Sept. 26 the febrile state had ceased, but the wound did not look well, the exuberant granulations still manifesting a tendency to ulceration and sloughing. On Oct. 24 the head of the service revised the wound under anesthesia. All the granulations were scraped away. The head of the fibula, necrosed and detached at the epiphysial line, was found floating in an abscess occupying the interosseous space. Careful search not revealing the presence of other abscesses, the rough and uneven articular surfaces of femur and tibia were shaved with a strong cartilage knife, then brought together in their normal position

the first time since admission. The retracted skin flaps were dissected up sufficiently to permit partial approximation of button sutures, and the limb was dressed in the extended posture. The next day the patient's temperature was normal and remained so to the end. In a fenestrated plaster-of-Paris splint the wound healed gradually. Bony union was present by Dec. 1, and the patient then began to walk. The ultimate healing of the wound was retarded by the lack of integument caused by its retraction, but was ultimately accomplished. The boy was discharged cured on April 8, 1900, with a firmly anchylosed joint, and no appreciable shortening.

We shall wind up this subject by bringing another history, quoted from my text-book on surgery. It contains a lesson and a warning:

Max Loffmann, butcher, aged twenty years. Admitted Oct. 25, 1885. On Oct. 12 the submuscular recess of the knee-joint was accidentally incised with a filthy butcher knife. Synovia escaped from the small puncture, and the patient walked a distance after the accident. The next day suppuration of the joint set in with a rigor, but the local practitioner—the patient lived in Jersey City—continued to dress the wound with strips of adhesive plaster. Thirteen days after the accident the patient entered Mt. Sinai Hospital. He was intensely septic, had a dry and foul tongue, high and continuous fever, and large quantities of thin, ichorous pus were seen escaping on slight pressure from the distended joint. Immediately the joint was incised in five places, when it was found that the synovial lining was coated with a greenish gray adherent and putrid membrane, similar to that seen in pharyngeal diphtheria. In making the incisions, a number of small periarthritic abscesses of the size of a pea were traversed by the knife. Continuous irrigation was installed at the same time. The fever remained unabated and locally new abscesses formed around the joint. Therefore, Nov. 4, consent to an amputation was urged upon the widowed mother of the patient, her only son, who, however, declined to permit it, suggesting that an attempt ought to be made to save the limb. Against his better judgment, on Nov. 6, the author performed excision of the knee-joint. As a matter of course, all the newly made wound surfaces were again infected, and profuse suppuration followed, the pus remaining thin and ichorous as before resection. Nov. 18 profuse arterial hemorrhage occurred from the wound. This was temporarily checked by the application of Esmarch's band. Hastily summoned to the hospital the author found the patient blanched and pulseless. A saline infusion seemed to have improved the pulse sufficiently to permit of amputation, which was quickly done in the middle of the thigh. But the patient expired before the Esmarch band was removed. The post-mortem examination revealed a sieve-like perforation of the popliteal vein, and a large oblong defect of the popliteal artery, both of which were found exposed and were surrounded by a massive blood-clot. The walls of the cavity containing the clot consisted of broken down and necrosed tissue. The sawn surfaces of the tibia and femur were necrosed, their edges jagged and eroded. There is little doubt that an early amputation might have saved the patient's life.

In concluding our subject, mention must be made of gunshot injuries to the knee-joint, the statistics of which, drawn from the records of pre-antiseptic wars, presented, whenever an attempt had been made to conserve the limb, most formidable mortality. This mortality rose sometimes to 100 per cent., and compelled the surgeons to condemn every attempt at conservation, and to amputate immediately above the knee. This was the status of knee-joint surgery at the conclusion of the Franco-Prussian war. In the Turco-Russian war, which was ended by the peace of St. Stefano, antiparasitic surgery had its first extensive trial, and came out of the ordeal triumphantly. The surgeons sent by the Baltic University of Riga to serve in the Russian army, foremost among them Bergmann, treated a long series of gunshot fractures of the knee-joint conservatively and antiseptically. No probing was allowed, the surfaces were merely cleansed, disinfected and the limb, being dressed antiseptically was put up in a plaster-of-Paris splint. Almost all of the limbs thus treated were saved. Some joints even regaining their mobility. The lesson taught by that war was verified by the experiences of all subsequent wars, notably by our Spanish and by the Transvaal wars. It demonstrated over and over again that gunshot penetrating the human body rarely carried infection with it, and that gunshot wounds of the limbs, if not associated with dangerous hemorrhage, rarely demanded active surgical interference beyond cleanliness and rest.

Whether the experience of civil life is similar to that of war, the author cannot say, having had no opportunity for personal observation.

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## WHAT OUGHT WE TO EXPECT FROM CARDIAC DRUGS IN HEART WEAKNESS?*

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Several causes have of late years been at work to produce all sorts and kinds of neuroses of the heart or debility of the heart muscle and to hasten that degeneration of the circulatory system that comes normally only late in life. The principal causes of this ever-increasing cardiac and arterial weakness are the high tension of our daily life, the nervous strain of some of our pastimes, as bicycling and automobiling in cities, and not the least cause is the constantly and recklessly increasing consumption of coal-tar products for pain, whether for the omnipresent headache, or for simple neuralgias. One hardly realizes this daily tension and its effect on our hearts unless

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we analyze it. We rise on time in the morning (whether by an alarm clock, by the call of a servant, or by habit), eat breakfast and read the paper on time, a clock in every room and a watch frequently in our hand. We then, on time, meet office and outside engagements, college appointments, consultations, always and constantly carefully predeciding the amount of time that will be required and timing the next engagement by this decision. We then carefully subdivide this time and note by our watches even how long we can discuss a subject. An appointment kept by the other party even one minute late makes us restless. During the day long flights of stairs are rushed up, or elevators taken that go with a rush and stop with a plunge. If we drive, either horse or automobile, by the carelessness and haste of bicyclists or pedestrians our hearts stop, jump, or receive the vasomotor contraction check from the sudden anxiety lest we do an injury. If we are in a car or vehicle managed by some one else, we often receive the same real or needless shocks to our nervous systems and hearts. If we are ailing we fight nature's signal to relax and still keep up the pace. If we are actually sick, unless we are seriously ill, we fight and wrestle with the disease, whatever it may be, instead of calmly giving up and allowing the disease to be temporary master of ceremonies. Nature is badly hampered by nervous restlessness and the consequent impaired circulation. A calm mind and an even heart will allow nature to expel the disease if acute, and will mitigate or obstruct chronic disease until the last rampart is taken and the last gun fired.

You have only to change the subject of the above sentences to describe the lives of most men and women of our rapid age and country. Even the school children, and I might say the young children, see too much, do too much, are amused too much, receive too much, compete in school too much, are taught too much, are awake too much for the welfare of their circulation and nervous systems.

Other causes of cardiac debility are oversmoking in young men and too great a use of alcohol in young girls for the ever-increasing frequency of dysmenorrhea. Therefore hygienic treatment, hydrotherapeutic treatment, graded exercise, rest cures, and cardiac tonics are all prescribed more and more year by year.

To enumerate some of the types of cardiac weakness, we might divide them into acute and chronic debility. Acute debility could be due to any of the acute inflammations of the heart, or to acute dilatation, heart strain or athletic heart, which is a term that signifies a definite condition and I believe has come to stay; to collapse, which is really more of a paralysis and hence dilatation of the blood vessels; to syncope; to angina pectoris, and to the cardiac muscle degeneration due to fever.

Chronic cardiac weakness is due to chronic simple dilatation or to broken compensation in valvular disease, to myocarditis, to fatty degeneration of the heart muscle, and to general or local arteriosclerosis. Besides these positive disorders we have all sorts and kinds of neurotic disturbances giving both acute and chronic symptoms. It is unnecessary to even mention the symptoms and signs of any of these various cardiac upsets, but the successful treatment of any of them depends upon the proper understanding of the pathology of the case, and this pathology can only be made positive by a correct diagnosis of the condition. Many cases, however, require not only careful immediate study and discrimination, but even prolonged observation to positively decide the difference between an organic lesion and a neurotic irritation, and until the pathology of the case is understood the treatment will often be unsuccessful and perhaps absolutely wrong.

It is not my purpose to take up each condition above named and then map out a treatment, but I believe if we have some of our old well-worn tools sharpened we may the better mold the flagging heart into a normal condition. Which particular tools each of us will use depends upon our own judgment, and I might say individuality. Our tools in this case are the cardiac tonics and stimulants, and perhaps a little sharpening may make these tools the more ready for use. Let me here say that in speaking of the medicinal treatment of cardiac weakness I by no means intend to minimize or belittle the all-important general treatment above mentioned.

Drugs which increase the strength of the cardiac systole or which increase arterial tension increase the blood pressure in the aorta and consequently increase the activity of the circulation in the coronary arteries, and improve the nutrition of the heart muscle. Hence only such drugs as meet these requirements can be cardiac tonics.

If I may be pardoned a definition or two, I would describe a cardiac tonic as a drug that will more or less permanently strengthen the heart and pulse, and leave the heart in better condition after its action has ceased than it was in before. A cardiac stimulant, on the other hand, is a drug which will stimulate and perhaps for a short time strengthen a weak heart, but when its action has ceased the heart is left really in poorer condition than before unless the cause of the weakness for which it was given has ceased to act. In other words, it irritates the heart to better work, but at the expense of its reserve energy. Some drugs partake of both of these properties, being both quickly stimulant and leaving some permanent increased strength of the heart. Most cardiac tonics act slowly and cause the best results only after a more or less prolonged use. To meet the condition of shock or heart failure, or any sudden cardiac weakness, those drugs which are quickly stimulant to the heart and vasomotor system are indicated. It is a question of momentary emergency and not a question of cardiac nutrition, hence acute cardiac weakness calls for a cardiac stimulant, while chronic cardiac weakness calls for a cardiac tonic.

The principal cardiac tonic is digitalis, while the drugs which resemble digitalis in their action

are strophanthus, sparteine, cactus, convallaria, adonidine, and last, but not least, suprarenal preparations. Stimulating cardiac tonics are strychnine and caffeine, while the cardiac stimulants are alcohol, ammonia, camphor, nitrite of amyl, nitroglycerin and ether.

I do not intend to bore you by taking up many of these drugs, but will briefly state what we ought to expect therapeutically from a few of the most important, as I believe that it is difficult to always select the best drug for each case of cardiac upset, and that it is very easy to misuse a cardiac drug.

The queen and peer of all cardiac tonics is digitalis, and, though it is so well understood, a few words concerning it may not be amiss. The action of a therapeutic dose or the primary physiological action of digitalis is a slowing of the heart, an increase in arterial tension, an increased output of urine, and a diminution or disappearance of dyspnea, edema, exudates, and vasomotor, trophic and digestive disturbances due to the impaired circulation. The heart should rarely be slowed by digitalis below sixty beats per minute. If it is slowed beyond this point, or there is a feeling of constriction in the head, or there is a distinct reduction of the amount of urine passed in twenty-four hours, or the pulse becomes irregular, or there is nausea or vomiting, too much digitalis has been used and it should be stopped. Any or all of these symptoms can develop during the administration of therapeutic doses, due to the so-called cumulative action of this drug. This may be caused by some chemical condition in the gastro-intestinal canal causing rapid absorption of several doses incompletely previously absorbed, or the rate of excretion may be diminished by the kidneys not acting well and the above symptoms of overaction can develop. Hence, when giving large doses of digitalis, the patient should be seen frequently.

The conditions improved by this drug are those of chronic cardiac weakness from any cause except when due to myocarditis or to fatty degeneration, or, more definitely, digitalis should be used in broken compensation in valvular disease, in simple dilitation, in the irritable or weak heart of nicotine poisoning, in strained heart from overwork, overathletic exercise, severe marching, mountain climbing, etc.; also where there is poor vasomotor tone, and where there is edema or exudations with no serious kidney lesions.

The action of digitalis in slowing the heart by its action on the pneumogastric nerve gives the heart a much-needed rest, and the action on the cardiac muscle making the contractions more effective and more complete, thus acts as regulated calisthenic exercise, and the cardiac muscle is increased in thickness and strength. The greater force with which the blood is expelled through the aortic orifice plus the contraction of the blood-vessels so raises the blood-pressure in the aorta that the circulation through the coronary arteries is increased and the nutrition of the heart is improved. The abnormal valvular conditions without adequate compensation that digitalis would most benefit are those in which slowing of the heart would be of value and those in which hypertrophy of the left ventricle would be of value, digitalis acting with the greatest force upon the part of the heart that has the greatest amount of muscle tissue, namely, the left ventricle. As far as the lesion goes digitalis is of greatest benefit in mitral insufficiency, next in mitral stenosis, next in aortic insufficiency, and next in aortic stenosis. The greatest amount of benefit from slowing of the heart is seen in mitral stenosis, while in aortic regurgitation a prolonged disastole due to much slowing of the heart would be a disadvantage, while in aortic stenosis the strong left ventricle contracting against a great resistance should cause digitalis to be used with care. The satisfactory action of this drug when compensation is weakened in valvular disease may be many times repeated, but sooner or later in many cases of severe valvular lesion with recurring incompetency the cardiac muscle becomes so deteriorated that digitalis is no longer able to restore the hypertrophy. Some patients do well with small doses of digitalis long continued for months and even years, other patients with valvular disease and incompetency after the hypertrophy has been restored by digitalis may not again need a cardiac tonic for months until some unusual exercise or mental anxiety or severe sickness has again broken the compensation, and again digitalis will improve the condition. Often, however, in cases that have repeatedly taken digitalis, or in some patients always, one of the other cardiac tonics will serve us better than will digitalis.

In any condition in which the right side of the heart is dilated and incompetent without valvular lesions, as occurs in pulmonary disturbances such as pleurisy, empyema, advanced tuberculosis, and especially emphysema, digitalis is of benefit.

In conditions of sudden cardiac failure or shock from any cause the action of digitalis is so slow, even if given hypodermatically, that it should not be relied upon to meet the emergency. If the shock or cardiac distress can be overcome for the time being by other drugs, digitalis given at the time will in some hours begin to add its powerful stimulation to the heart and blood vessels.

In acute endocarditis occurring as a complication in acute rheumatism it is a hard question to decide as to whether digitalis should or should not be used. On the one hand the heart at this time should not be stimulated to more sturdy contraction. On the other hand the slowing of the heart by digitalis at this time can but do good by modifying the movements of an inflamed organ. If the heart with endocarditis is beating at the rate of 110 beats per minute it would seem good treatment to cause such physiological rest as would be produced by reducing the pulse rate to 80 or 90 beats per minute, or about 30,000 beats less in twenty-four hours, and this by a drug that will not weaken the heart.

In the feeble heart of myocarditis and of fatty degeneration the utility of digitalis is much less

pronounced, and the advisability of using it at all has been questioned. However, in many of these cases if the drug is given cautiously in small doses it will prove of considerable benefit, as many times we are not certain that there is actual degeneration of the cardiac muscle, and also it is impossible to decide how extensive the degeneration is even if we assume that it actually exists. It is plain that we should not deny the patient the possible benefit of digitalis, though at the same time its action should be carefully watched. If the cardiac muscle is not overstimulated at the same time the pressure in the aorta is made nearer normal the better circulation through the coronary arteries may delay the progress of the degenerative process unless there is serious atheroma.

Digitalis should not be used in endarteritis or atheroma and hence ordinarily not in aneurism.

In the insomnia of neurasthenics or where there is general vasomotor debility, when the patient is drowsy when up and wakeful when he lies down, the tone of the blood-vessels being so poor that the blood tends to gravitate to the lowest part of the body, digitalis acts often as a good soporific. It may be used for this purpose alone or if given conjointly with some hypnotic will make a much smaller dose of the latter successful than when it is used without the digitalis. In fact in neurasthenic conditions or conditions of vasomotor ataxia digitalis is a general tonic to the whole system, improving the general circulation and increasing the general nutrition.

In delirium tremens whatever cardiac treatment is given should be given hypodermatically, as drugs administered by the stomach are either not absorbed at all or are absorbed very slowly, which accounts for the harmlessness of the enormous doses of digitalis given by the mouth in this condition.

When there is edema of the lower extremities from anemia, and where there are effusions without kidney lesions, and when there is chronic liver disease, digitalis combined with other proper treatment is always of benefit.

As to the use of digitalis in renal inflammation, the writer is of the opinion that no fixed rule can be given. Theoretically, in acute renal inflammation digitalis should not be used. The same is true in uremic poisoning. However, with low vasomotor tension and a weak heart digitalis should be tried, in not too large doses. If it does not give good results in thirty-six or at least forty-eight hours, it should be stopped. If the results are good the size of the dose should be diminished, as overaction from digitalis can certainly readily take place in kidney lesions.

The contra-indications to the use of this drug are a high tension of the arteries, atheroma, a weak cardiac muscle from prolonged fevers or from fatty degeneration, myocarditis, and ordinarily a serious kidney lesion. Inflammation of the stomach or even severe dyspepsia should cause some other cardiac drug to be substituted.

The best substitute for digitalis is strophanthus, which I am accustomed to describe epigrammatically as "acting just like digitalis, only less so;" viz., it is less of a cardiac muscle-stimulant, less liable to produce nausea and vomiting, less liable to cause cumulative action, produces less contraction of the blood vessels, and, perhaps, by directly stimulating the kidney, is a little more of a diuretic.

The indications for preferring and using strophanthus in place of digitalis might be stated as: (1) When there is need of a cardiac tonic and digitalis produces nausea, vomiting, and too great an increase of the blood pressure; (2) when a cardiac tonic is indicated and the blood pressure is already high; (3) when a rapidly acting cardiac tonic is desired; (4) when there is more nervous irritability and weakening of the heart than actual muscular debility or incompetency; (5) children are very susceptible to the action of digitalis, and hence strophanthus is many times a better drug for them when a cardiac tonic is indicated.

To briefly characterize the less important cardiac tonics, we may say that a therapeutic dose of sparteine sulphate should slightly slow the heart, regulate its rhythm, prevent its nervous irritability, slightly diminish the pulse tension, and moderately increase the output of urine. This drug is not a substitute for digitalis. The indications for its use are irregularity and nervous irritability of the heart, especially when conjoined with general nervousness. I have seen it of marked advantage in the disturbed cardiac action combined with increased tension of the arterioles and diminished output of old age. Muscle or fatty degeneration of the heart, low pulse tension, and dilatation of the heart, or acute cardiac weakness should prohibit the use of this drug.

In regard to cactus, my observations, when a fresh active preparation of the fluid extract has been used, have shown that it would regulate the heart, quiet its nervous irritability, and render large doses or the constant use of strong cardiac tonics often unnecessary. This drug does not cause increased cardiac muscular strength as does digitalis. It is however, of value in having no cumulative action, in seeming not to wear itself out, and to have good action after compensation has been reestablished by digitalis in valvular disease and still some cardiac tonic must be given to keep the compensation intact. When the heart is weak in convalescence from acute disease and digitalis is not a good drug to use cactus is beneficial. The same is true in the debilitated heart of old age when digitalis is contra-indicated on account of its so markedly raising the blood-pressure. In functional disturbances of the heart, as arhythmia, palpitation, or tobacco heart, this drug is of value.

Convallaria and adonidine are to me unsatisfactory drugs.

Barium chloride, though a drug not much used, has a powerful stimulant effect on the heart muscle, and causes the blood-vessels to contract. It acts quickly, and should perhaps be resorted to more frequently than it has been.

The action of suprarenal is now so well understood that it need not be more than mentioned except to emphasize the fact that it acts as a vasomotor and cardiac stimulant only when absorbed from the nose or mouth, and not after it has been swallowed into the stomach.

Of the two stimulant cardiac tonics mentioned, viz., strychnine and caffeine, the former is so much and so well used as to only require the caution that we do not inaugurate its good work too soon in acute disease, but should rather reserve it for the coming emergency. Also, as a general bracer in debilitated conditions or in conditions requiring tonics it is used too frequently and too much. In other words, we are too liable to continue to stimulate our debilitated cases rather than to rest them, and we are just now in the strychnine age, almost every patient receiving strychnine in some form.

Now, what should we expect from caffeine in therapeutic dosage? It quickens the heart, increases the tone of the blood vessels, increases the rate of respiration, stimulates the cerebral functions, increases muscle tone and power, diminishes fatigue, increases the output of urine especially the watery element, and hence raises the specific gravity of the blood, which will then get more water where it can find it.

The indications for the use of this drug are (1) as a cardiac stimulant; (2) as a cerebral stimulant; (3) as a muscle stimulant; (4) as a diuretic; (5) as an antidote in poisoning.

As a cardiac stimulant caffeine may be used at any time when such a stimulant is indicated. It acts quickly to tide over a period of cardiac depression, but is not as quick in its action in acute collapse as the reflex stimulation of a strong alcoholic preparation or the stimulation of ammonia. It is, however, a strong adjunct to the above, and with strychnine makes an active respiratory and cardiac stimulant with no secondary depression, and leaves the heart better than it found it. If there is a good deal of nervous excitability and muscle restlessness other cardiac stimulants and tonics had better be chosen. The same is true where there is high vasomotor tension. As a cardiac stimulotonic, caffeine is indicated in prolonged fevers in place of too much alcohol, and is good in typhoid fever in the form of a cup of black coffee given once or twice in the morning. It is, of course, best to avoid it in the afternoon on account of its tendency to cause wakefulness. It is a good adjunct or temporary substitute for digitalis, but is not a permanent substitute for the latter in cardiac dilatation or in broken compensation. As a cardiac tonic in weakened heart action with poor circulation and mental sluggishness it is often effectual, but patients with good compensation in valvular disease had best avoid the stimulation from much tea or coffee.

As a cerebral stimulant perhaps no drug equals caffeine, not only in cases unused to its action, but in those accustomed to its use.

While we cannot say that there is a true coffee or tea habit, *i. e.*, an intolerable and uncontrollable desire for caffeine, still at the regular hours for coffee and tea stimulation, if it is omitted, the majority of patients miss greatly its effects. The hard brain-worker at irregular hours, as editors, reporters, authors, and students just before examinations, increase the number of hours in which the brain will work well by frequent cups of coffee, learning that it is the best and most effectual stimulation that they can take and leads to no immediate secondary depression.

As the coffee wakes up the brain, so to speak, it also stirs up the spinal cord and peripheral reflexes. The man after this cerebral stimulation then smokes a good deal, which soothes the spinal irritation, and he then, having coffee plus tobacco, can do an immense amount of brain work. If this is kept up long, sooner or later, depending upon the individual endurance, a nervous, irritable condition supervenes, with insomnia, anorexia, loss of weight, tremulous tongue, perhaps some trembling of the hands, with a pale or yellowish skin due to disturbed liver function and perhaps some kidney or bladder irritability, with probably a nicotine heart. We have then a neurasthenic to treat, which means to stop all coffee, tea, and tobacco, give mental rest, change of air and scene, and the institution of every legitimate means or subterfuge to produce sleep.

The contra-indications to the use of caffeine are palpitation, irritable heart, high blood pressure, cerebral or spinal inflammations or irritations, insomnia, neurasthenia, and acute genito-urinary inflammations.

Now, a word as to the much misused cardiac stimulant alcohol. There is a considerable difference of opinion to-day as to the value of alcohol as a cardiac stimulant. Its action on the vascular system, however, is marked and positive. The irritation which strong alcohol in any form causes on the mucous membrane of the throat, esophagus and stomach acts reflexly through the medulla to cause vasoconstriction, and hence a rise of blood-pressure, and increased blood-pressure is always a stimulant to the heart. After alcohol is absorbed into the blood, where it circulates as alcohol, it cannot, in my opinion, by its physiological action on the vasomotor centers, on the blood-vessels, and the heart, ever be a stimulant, although as its secondary effect is to dilate the blood-paths, this very fact of increasing the peripheral circulation may better the condition of the heart. Through, then, the irritant impact of the alcohol on the mucous membrane the blood-pressure is first raised, but when it is absorbed the blood-vessels dilate, especially those on the surface of the body. This relieves any spasmodic contraction of the peripheral blood-vessels, whether from fear, from pain, or from chilling of the body, and this equalization of the circulation relieves any internal congestion that may be present. By this widening of the blood paths, provided no condition of shock is present, alcohol will relieve the laboring of a weakened heart. If too large doses of alcohol are given, this vasodilatation goes on to

partial paralysis of the blood-vessels, and a weak action of the heart from this cause alone will occur. Hence in shock where the blood-vessels are widely dilated or perhaps paralyzed either from chloroform or ether narcosis, or from morphine narcosis, alcohol, except for its primary stimulant action in small doses, would do harm and is contra-indicated.

The exact action of alcohol on the heart itself is not proved beyond a reasonable doubt. Certain it is that overdoses of alcohol after absorption are depressant to the heart muscle, to the muscle fibers of the blood-vessel walls, and to the vasomotor center in the medulla. In sudden cardiac failure the reviving action of alcohol seems to me to be due entirely to the reflex stimulation of the mucous membrane of the throat and stomach. By this stimulation we cause an increased cardiac frequency and a slightly raised blood-pressure from the contraction of the arterioles due to the reflex action on the medulla. This action, which occurs before much alcohol has been absorbed, may tide over the condition of acute cardiac failure, and if not much alcohol has been given, there will be no future cardiac or vascular depression. If too much alcohol has been administered and absorbed the result will be to increase the previous depression unless more fresh alcohol is given for its continued stimulant reflex effect. If the previous doses are not too large and are hence rapidly burned or eliminated the effect will be continued stimulation and not depression. In conditions of high temperature where the heart is very rapid from the stimulation of the fever, from the irritation of the toxins in the blood and from nervous irritability, alcohol, by quieting the nervous system, dilating the peripheral blood-vessels, and possibly combating the toxins in the blood, generally reduces the temperature and slows the pulse. If the dose is properly regulated this action will be found to be continuous for good. Too large doses or too frequent administration of alcohol may do one of two things; either stimulate the brain and cause more excitation, increasing the temperature by increasing muscular irritability and restlessness, and causing enough of its local reflex irritation to make the pulse bounding and full, or, if it is too rapidly absorbed, it will give the symptoms of alcoholic depression on the circulatory system. Hence in acute cardiac failure to get the stimulant effect of alcohol it must be given concentrated, as exemplified by brandy, whisky, gin, rum and champagne, and in small doses. To keep up this stimulation, another dose must be given in from fifteen minutes to half an hour or an hour, depending upon the continuousness of the heart weakness, in order to repeat the stimulation of the irritation. As just stated, the dose should undoubtedly be small, as the future depression from the absorption would be less than it would from large doses. If the frequency of the dose is such that alcohol piles up in the system and more is given before the previous ingested amount has been burned or eliminated, to obtain stimulation it will be necessary to give larger and larger doses, first to overcome the depression caused by the previous alcohol, and to also cause the usual stimulation. As more and more alcohol is absorbed, whether from the stomach or from hypodermic injection, depression, vasomotor dilatation, cardiac weakness, and more or less paralysis of the nervous system are sure to follow. Hence to combat continuous or persistent cardiac failure or depression alcohol is the poorest stimulant we can use, and if much is given we are poisoning the system and adding depression to depression that is already there, and the treatment is vicious.

In conditions of prolonged fever where alcohol is given no more frequently for any length of time than every three hours, one dose is probably eliminated or burned before the next one is given, and we get the primary stimulation plus the dilatation of the peripheral vessels, which equalizes the circulation and reduces the temperature.

Let me parenthetically say that I have often obtained the same good circulatory results in sthenic fever from small doses of nitroglycerin that I have obtained with alcohol.

In serious feverish conditions undoubtedly the narcotic effect of alcohol in quieting the patient who is highly alert to his danger, may be of distinct advantage, as mental worry and anxiety are great disturbers of the heart and circulation, and should be overcome by any legitimate means.

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## A STUDY OF GOOD RESULTS IN HIP DISEASE.*

BY V. P. GIBNEY, M.D.,
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A MEETING of the Academy in a Summer month precludes the introduction of a scientific paper, and the few fellows who have acquired a habit of attending are entitled to a consideration which the writer feels in duty bound to extend. The selection of a title, therefore, carries with it an effort to make a practical talk on some questions that are always appearing to the body politic in medical circles.

A question that confronts the doctor in the early stage of hip disease is, Can a "good result" be obtained? An experience of more than a quarter of a century in dealing with diseases of the bones and joints ought to enable the possessor of such an experience to define "good results." The best result that any form of treatment can secure is perfect restoration of function without shortening or deformity. Such a result is so rare that the term "good" has been accepted as satisfactory. Why the "best" is so rare it may be well to set clearly before this audience the meaning of "hip disease." A technical definition is not attempted, for this will not give one a clear idea of the malady under discussion. Practitioners are too prone to rely on certain stereotyped signs for a diagnosis. For example, if one finds on examination of a child in whom hip disease is suspected a limp more or

* Read before the New York Academy of Medicine, June 4, 1903.

less pronounced, a loss of contour in the nates of the affected side, an inability to flex, to extend, to abduct, and to adduct to the normal limit without pain or resistance, the conclusion is often reached without analyzing the finer points in the clinical and personal histories of the case. Now, should all the aforesaid signs be present, a certain consideration should be given to the pathology, the etiology, and, above all, to the first appearance with the date of symptoms. There are so many lesions, quite simple in character, that impair the functions of the hip, sometimes to the point of immobilization, that mere signs of themselves cannot be accepted as absolutely diagnostic.

The hip disease under discussion this evening is, pathologically speaking, a tuberculous osteitis of the neck, or head, or the acetabulum, one or all. The lesion has its starting point in one or more of the centers of development, and long before the wonderful discovery of Roentgen careful diagnostication was reasonably accurate in locating these initial lesions. The X-ray is shedding light on these lesions and promises great assistance in the recognition of these inflammatory foci. However good a radiograph may be, it is requisite that a certain facility in interpretation is to be attained before one can say definitely whether a lesion exists or not. It may be taken for granted, therefore, that the radiograph is, up to the present time, only an aid in diagnosis.

From an etiological standpoint it must be remembered that diseases are not inherited, but that the predisposition and vital resistance are inherited. So that if an ancestor, near or remote, has had hip disease, it does not follow, by any means, that the patient in question has hip disease. Our consideration only must be accorded the vital resistance.

The clinical history is a very important factor in estimating a diagnosis. There may be at the outset an acute exacerbation, yet this is the exception. A slight limp is the first sign observed, pain in the knee only occasional, complaint when an extra function is called into play, such as pulling on the shoe and stocking and going up or down stairs, a stiffness in the morning gradually wearing off toward midday, more pain in sleep if the patient has been specially active during the day, screaming pains at night and usually without waking, a general disinclination to use the limb, and above all, the persistence of the limp. Now, all the foregoing symptoms usually precede the exacerbation that calls for medical or surgical advice some two or three months. The parents are satisfied when a neighbor suggests growing pains, or rheumatism, or malaria. Given now such a history, the test of function ought to enable one to make a diagnosis of the hip disease, the result of which we are now considering.

In the interest of the patient and the father and the mother, it must be urged, "Make a careful test of all the functions." Do not be satisfied with anything short of an examination of the patient nude and on a table or floor, without a mattress. Remember, too, that a test of the functions of the sound hip are necessary as preliminary. Comparisons can then be made satisfactorily and the meaning of hip disease now clearly understood.

Pardon, please, the mere mention of a few of the lesions that are often called hip disease, and no attempt will be made to enter into a differential diagnosis. There comes to mind at this moment a contusion of the hip, clearly traumatic, a periarthritis, either phlegmonous or rheumatic or traumatic, involving the muscular tissue or the capsule and ligaments, a coxa vara, rachitic or traumatic, a congential dislocation of the hip—easy of recognition if one will spend a little time on the case, a trauma involving the femoral neck or the periosteum of the shaft near the trochanter-major, a psoas abscess, a perityphlitis, a poliomyelitis, a neurosis dependent on an irritable spine or a toxemia or a hysterical hip.

In this prolonged definition with examples it may be claimed that "good results" are being crowded to the rear. The writer never has any apology to offer for time occupied in emphasizing points in early diagnosis and pathology. He regrets to say that the knowledge displayed by the average practitioner on these two topics is as yet lamentably deficient.

A good result as understood by the parent is a life saved, often a limb, yet an ease in getting about unassisted by splint, crutch or cane. Over an inch shortening is not regarded with complaisance. An inch or less is satisfactory. It usually depends on the point of view and the coaching of the surgeon in charge. Comparisons are not odious, for always a deformity that might have been more hideous, a disability that might have been more disabling can be pointed out, and the situation is accepted.

A good result from the practitioner's standpoint is arrest or termination of the disease, regardless of the position in which the limb is left. Anchylosis is rather courted, and if a stable, firm union is secured, it is believed that the patient will be free from any late exacerbations and locomotion will not be seriously impaired. The claim is often made, too, that a cure with a flexion deformity enables one to sit more comfortably and to dress oneself with more ease than if the anchylosis existed without deformity. Here again the point of view is to be considered. For one whose vocation is to be a sedentary one there is no question but that an angle, say, of from 135 to 150 degrees fixation is better, but where one's vocation takes him out of doors and does not interfere with all kinds of sport, the position should be straight, that is, anchylosis, if anchylosis must exist, with either flexion or adduction deformity.

Studying further this result, which may be called the medical result, one finds the patient as puberty approaches sometimes dissatisfied with the existing deformity, and relief is sought at the hands of the general surgeon. An osteotomy, either simple or cuneiform, is done and the limb is placed in what is honestly believed to be a good position, that is, straight with the axis of the body. It matters little what means are em-

ployed for fixation, disappointment comes on removing the appliance, for the deformity has not been fully corrected. It is within the observation of the writer to have seen many, many instances of such failure. And here again comes the philosophical assurance that this is much the best result one could expect. All the time one finds apologies for results in hip disease, and the profession has not awakened fully to the belief that better results can be obtained than statistics already furnish.

What does the orthopedic surgeon regard as a good result? Here again we lack unanimity. One whom the lay press has placed at the pinnacle has claimed that anchylosis without deformity is the best we can expect. Plaster-of-Paris is used to allay irritation and encourage anchylosis. The writer of this paper has seen a few results from prolonged use of plaster-of-Paris supplemented by axillary crutches, but he has not seen many results after the prolonged use of plaster-of-Paris as a fixation dressing associated with the use of the limb. It is his impression that statistics of results in this country would be hard to obtain.

Surgeons who claim that early excision yields good results are not able to furnish the proof. If the disease on section is found extensive, too much of the bony tissue must be sacrificed, and not infrequently a flail joint is the result. Early excision is not popular in this country because of the mortality and of unstable limbs.

Among orthopedic surgeons whose practice is not confined to splints, there is a growing tendency to remove by small aseptic operations the foci of disease demonstrated by the radiograph. Some find it advantageous to evacuate small collections of pus by means of the scalpel when the needle will not suffice. All of these operations, however, should be followed by protection apparatus. It has been abundantly proven that the best results are obtained by the early use of splints that immobilize the joint. Such appliances, to be efficient, must be long continued, irrespective of that bugbear of the laity and some practitioners, muscular atrophy. Among the best informed of orthopedic surgeons the results attained over a quarter of a century ago by the late Charles Fayette Taylor have not been surpassed, and this pioneer claimed that muscular atrophy was a thing to be courted.

The good results which are acceptable to men in our branch of surgery are results with the minimum amount of shortening, without deformity, and with the maximum range of motion. Our aim however, is to get not "good results," but "best results," and the more we can approach perfect function the better we are satisfied. Results after all must be studied on a basis of the stage in which well-recognized methods of treatment are begun. The keen diagnostician will recognize the lesion before the deformity arises and at an early stage, while the poor diagnostician will fail to recognize hip disease until the mother of the child has already made the diagnosis herself. Then the second stage, that of deformity, will have been reached and the advantages of early protection are lost. The tardy recognition of the value of instruction in orthopedic surgery by the medical schools throughout the country is largely responsible for the destruction of hip joints and the hopelessness of restoring functions to points thus impaired. And yet we have reason to hope for better results because nearly all the large and well-equipped schools of medicine have within the last decade established such chairs, and the younger practitioners who will ere long make their influence felt will thus increase the number of those who get efficient treatment before the second and third stages are reached.

The results ought to be good and many cures ought to be obtained, cures that have no trace of deformity or impairment of function. Where treatment is delayed until the bacilli have already played sad havoc with the head and neck of the femur, fair results may be obtained by close attention to details and by intelligent home cooperation. Here one must be posted on the damage to tissue an abscess can cause, and steps will naturally be taken to curb its virility. Occasionally a fine result can be secured, but this can hardly be expected.

In the third stage we must be content with correcting deformity and eradicating necrotic areas and sinuses. Results that will satisfy can be secured if we maintain the best position of the limb. If by faulty technic we fail to hold what we get, then do not hesitate to repeat efforts at correction, not resting satisfied until the maximum benefit has been secured as a lasting result.

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## CHRONIC NEPHRITIS WITHOUT ALBUMINURIA.

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The writings of Rayer, Dieulafoy, Lancereaux, Lepine, Stewart, Wilks, Mahomed, Purdy, Saunby, and other authorities have made us familiar with the fact that albuminuria may be temporarily or mainly absent from the urine during nephritis, especially during chronic interstitial nephritis. While this fact is now common knowledge it is not so fully appreciated that nephritis may progress to an immediately dangerous stage, with continued absence of albumin from the urine. It is worth noticing, especially, that often, notwithstanding that the urine is absolutely free from albumin, cardiovascular developments may be far advanced and the fatal issue not far distant. Even symptoms, ordinarily included among the terminal developments of chronic nephritis, may prevail without the urine giving the albuminous reaction. Thus albuminuric retinitis, chronic uremia, or cardiac incompensation may become established and presage an early termination of the case without the presence of albuminuria.

The absence of albumin is not confined to chronic interstitial nephritis, but has occasionally,

although more rarely, been noted in chronic parenchymatous nephritis and acute nephritis, even of the postscarlatinal type.

I have chosen from a series of cases that have fallen within my experience the following examples, which I shall briefly relate, as illustrating how extreme may be the development of chronic nephritis, without the occurrence of albuminuria, appreciable by the methods in use. In testing for albumin, I have, in every analysis, used several tests, in order that my results might be devoid of the error, so easily possible when but one method is employed. I have eschewed the use of the extremely delicate tests, such as the potassiomercuric iodide, picric acid and trichloracetic acid, having long since grown to distrust them as being oversensitive and liable to error, with peptone-albumose, nucleo-albumin and alkaloids. The method pursued consists in the successive application of the potassium-ferrocyanide, Heller's nitric-acid, and the heat-with-acetic-acid tests.

*Case I.*—Young man, thirty years of age, of excellent habits and unimpeachable heredity was referred to me by Dr. L. E. Schwarz, of this city. Patient's previous history had been uneventful, save for a severe attack of the grip, lasting one month, at the age of twenty. Several less severe influenzal attacks have occurred since that date. Visual disturbances had led him to consult Dr. Schwarz, who, upon examination, found a typical neuroretinitis of albuminuric type of the left eye. There was a slight blurring of vision of upper and lower temporal fields, but central vision was never disturbed. The papilla was swollen, opaque and reddish, with all outlines lost; infiltration, opacity and swelling of retina marked. Hemorrhages were present, but neither numerous nor large, and were situated in the upper and lower nasal and temporal portions of fundus, and within three diameters of the disk. The large arterial elements were entirely obscured at points, numerous white plaques or foci of degeneration showed in the macular region, especially downward and inward, but were without regular arrangement. I am indebted to Dr. Schwarz for these details of the retinal condition. The patient displayed an entire absence of symptoms of ill health, except some dyspnea and slight precordial uneasiness upon exertion. He was habitually constipated. The prostate was found moderately enlarged, although not tender.

Physical examination revealed distinct but moderate cardiac hypertrophy, marked arterial fibrosis and tension, and the urine was entirely free from morbid characteristics, except for the presence of hyaline casts and reduction of urinary solids, below the normal average. Under treatment the retinal condition improved and the urea excretion increased, from a daily average total of 350 grains to 450 grains. In June, 1902, it is interesting to note, patient suffered an attack of primary labyrinthine vertigo (Menier's disease), no doubt due to hemorrhage into the semicircular canals of the right ear. Hearing on that side still remains markedly deficient. Not a single one of the 18 twenty-four-hour specimens of urine examined, during the twenty-eight months of my observation of this case, revealed the slightest trace of albumin. Hyaline casts in very sparse numbers have invariably been disclosed by careful microscopic examination.

*Case II.*—Woman, fifty-two years of age, of neuropathic heredity, never robust and the subject of periodic hemicrania. The clinical history of this patient's nephritis was ushered in by uremic convulsions, suddenly developing, after a few day's indisposition, from functional digestive disturbance accompanied by dizziness and headache. It was only with the greatest difficulty that patient was rescued from the severe toxemia. She lived for three and a half years, at the end of which period a second, and this time fatal, uremic development terminated the case. During this interval many single and twenty-four-hour specimens were examined, but at no time was albumin found in the urine. Casts hyaline in character were constantly to be found in the urinary sediment, although in very small numbers. Cardiovascular changes were well developed and troublesome nocturnal polyuria greatly disturbed the patient's rest. The urine frequently reached as high as 100 ounces in the twenty-four hours and was of uniform low specific gravity. The total urea and other urinary solids were greatly reduced, and it was only by the most careful supervision of the patient's habits and persistent stimulation of the emunctories that uremia was for so long averted.

*Case III.*—Woman, fifty-eight years of age, weighing 110 pounds (normal weight), first consulted the writer in May, 1901, complaining of dizziness, frequent blurring of sight, slight edema of feet and frequent nocturnal urination. No dyspnea or palpitation present. Physical examination revealed a hypertrophied heart, well developed vascular sclerosis and distinct arterial tension, which was readily appreciated by the examining finger and beautifully expressed in the sphygmogram. Heart sounds were clear and booming with marked accentuation of the second aortic. Three months after first consultation, cardiac dilatation supervened, and ever since that time a distinct blowing mitral systolic murmur has been audible, slight dependent edema has been constantly present and dyspnea of effort has prevailed. Retinal changes, present in their incipiency, progressed at the time of the cardiac incompetency, and a typical bilateral albuminuric retinitis became established with almost entire loss of vision. During the eighteen months which have elapsed since the time of these developments the patient has been under constant observation. The visual acuity has fluctuated with the general systemic condition and the circulatory integrity has been fairly maintained by the measures employed. Uremic manifestations have developed from time to time, and the patient is at present under daily attention for a serious uremic state. The interesting feature of this case is the urinary condition. In all 55 twenty-four-hour collections

of urine have been submitted to careful testing. In only three of these specimens was albumin found in demonstrable amount and this albuminuria was minimal and coincided with circulatory disturbances. The specific gravity and urea have invariably ranged low, the latter seldom rising above 200 grains in the twenty-four hours. Casts of hyaline and light granular character, but in small numbers, were constantly revealed by microscopical examination.

Latency of symptoms is a characteristic which so frequently marks the form of nephritis, known as primary chronic nephritis or interstitial nephritis, that it may almost be designated its most distinguishing feature. This lack of emphasis holds more particularly with reference to the urinary signs, but is also, although to a less extent, remarked in the general physical manifestations, particularly their subjective expression, and it prevails more or less throughout the entire course of the disease. The cases reported certainly demonstrate that latency of symptoms is not a point of absolute distinction between the early and the advanced stages, or between the slight and the severe forms of the malady. Seldom in any given case will one have at hand an unbroken association of symptoms, urinary and physical, from which to construct the diagnosis. The discrepancy between the clinical symptoms and the renal damage is often extreme and at autopsy it may seem impossible to connect the atrophied degenerated kidneys with the urine, which has been the outward expression of the disease during life. It is by no means uncommon for lesions to exist in a relatively advanced state without the patient consciously suffering from any marked disturbance of health. So much is this the rule that many, if not the majority, of these cases are revealed accidentally in persons undergoing medical examination for reasons other than the relief of symptoms, produced by the disorder, and this, even at a time when the organic degeneration has progressed to such a point as to preclude the possibility of a long survival. As a rule the diagnosis must be made during the early stages, from physical signs, rather than from subjective symptoms. When symptoms arise the disease has already existed for a considerable period, and the renal lesion is far advanced. Such symptoms as exist during the early progress of the disease represent such a slight departure from the normal that they are rarely made the subject for complaint by the patient, and may only be elicited after direct and pointed interrogation. They most commonly consist of some degree of polyuria and evidences of circulatory disturbance under strain. Polyuria is the most constant and, in the majority of cases, the only urinary symptom remarked during this period. It does not become established until cardiac hypertrophy has taken place and ever after and until compensation fails, and the blood-pressure in this way becomes lowered, it remains a constant feature of the clinical picture. In those rare cases in which, for any reason, cardiac compensation fails to become established, polyuria will be absent. Rarely is this symptom made the subject for complaint upon the part of the patient, who generally regards it as a favorable sign that urine is passed freely. The distinctive feature of the polyuria of this form of nephritis is its nocturnal character. Almost invariably the amount of night urine greatly exceeds the amount of the day's output. In well-developed cases I have seen the night urine amount to four times that passed during the day. The patient's rest is disturbed by the necessity for urination, which this excess imposes, and he consequently may rise a number of times to void urine. Various explanations have been advanced to account for this curious phenomenon, but I believe the true one to be the increase in vascular pressure, following recumbency. We often see this increased pressure manifested in other interesting ways in this disease. To illustrate, I cannot do better than to relate the following case:

*Case IV.*—Large, fleshy woman, fifty-two years of age, was operated for uterine fibroid in 1894, at which time a diagnosis of Bright's disease was made. Writer was consulted in February, 1901. Subjective symptoms were entirely nocturnal and of such a character as to make patient dread the approach of bedtime. Lying down was the signal for great mental restlessness, which frequently, for hours, precluded the possibility of sleep. Occipital headache and vertigo often came on shortly after retiring for the night, and backache of purely nocturnal development was often very troublesome. An additional source of disturbance was the necessity for urinating two or three times each night. As the result of these combined deterrents only three or four hours' sleep could be obtained each night.

Physical examination revealed a forcible cardiac apex, six inches to the left of the midsternum. The apical region was tender to palpation. Frank arterial tension and sclerosis were present. Not to go farther into the details of this case, I will merely add that its progress has been typical and eventful, cardiac dilatation having supervened this winter. The urine has been carefully observed in a routine way. Casts have been a constant feature of the urinary sediment in every specimen examined. In all 13 samples, each of them a twenty-four-hour collection, have been analyzed. Only two of these specimens gave any reaction for albumin and then a trace only. This minimal albuminuria occurred during the circulatory crisis of the past winter.

Almost invariably the normal healthy adult experiences no need for emptying the bladder during the average hours of sleep, unless he has indulged in some unusual excess of fluids immediately before retiring. The exceptions to this rule are, I believe, rare. Certain affections of the lower urinary tract, the urethra, bladder, prostate, occasionally through irritation or abridgement of the containing power of the bladder, will cause nocturnal urination. Certain systemic causes, such as nervous hydruria, diabetes, excessive acidity of the urine, pyelitis, calculous disease, etc., also

bring about this result. Excluding these causes, which result in a more or less sudden onset of this symptom and are temporary in their action, the great majority of instances in which this habit becomes established, are cases of chronic nephritis. It is necessary, before according weight to this symptom, to establish the fact that it has not always been the habit of the patient, for in rare instances such may be the case. As a rule the onset of the symptom is gradual and by such easy stages that it insensibly grows into a habit, without awakening any concern in the patient's mind.

Among the earliest manifestations of chronic interstitial nephritis are certain symptoms arising from the cardiovascular changes which are so constantly associated with this disease. The changes comprise widespread arteriocapillary fibrosis and cardiac hypertrophy. They develop *pari passu* with the renal change and go back as far as we may, so soon as the disease is demonstrable, the pulse tension is high and the artery thickened. The accessibility of the circulatory system to direct examination enables one to consult the heart and arteries for diagnostic data at a time when the urinary condition is so obscure as to leave us in great doubt. The changes in the arteries are widespread, and generally quite early in the disease become appreciable to the senses, in the well-known, stiff, tense vessel and hypertrophied heart of arteriosclerosis. As a general rule, there are only two forms of widespread arterial change recognized, viz., atheroma and that connected with chronic nephritis. Care must be taken, however, to exclude alcohol and syphilis, since both are capable of producing arteriosclerosis and myocardial changes. When this condition is met with in the prime of life, it should direct attention to the kidneys. Certain subjective manifestations soon result from this altered vascular state. The earliest symptom produced is a slight dyspnea of effort. Associated with cough, as it frequently is, the patient may suspect asthma, and seek advice for relief of the respiratory distress. Auscultation of the lungs under these circumstances will reveal nothing, and the contrast between the negative pulmonary findings and the dyspnea is suggestive. Palpitation and a sense of precordial fulness are frequently complained of. Certain obscure sensory disturbances of vasomotor origin may be the only indications present, as in the following case:

*Case V.*—Blacksmith, age thirty-four years and of 182 pounds weight. Patient temperate, but with history of past excesses. Syphilis denied and no stigmata present. Patient complains of sense of coldness of lower extremities from the knees down (cryesthesia). On close questioning confesses to recent slight dyspnea and precordial distress upon severe exertion. Reflexes normal, no disturbance of special sense impressions, sexual power unaltered, locomotion good. Physical examination reveals distinct arteriosclerosis and the cardiac apex diffuse and forcible in the fifth interspace, 5 inches from midsternum. Aortic second sound much accentuated, prostate somewhat fibrous, enlarged and tender, urine contains trace of albumin and numerous hyaline casts.

The urinary changes in the early stages of chronic interstitial nephritis are, as we have seen, inconstant and unreliable, as a means of estimating the extent of the renal dystrophy. Associated with the polyuria, already referred to, a lowered specific gravity is usually met with. The diminished density is no doubt largely due to dilution of the urine, brought about by the polyuria, but must not be entirely attributed to that cause. There is an actual deficiency of urinary solids, owing to renal inadequacy. If from any cause, such as fever, excessive sweating, diarrhea, the urine becomes reduced in amount, there is not that proportionate increase in the specific gravity which is characteristic of normal urine. Careful estimation of the urea in the twenty-four-hour urine, by means of a reliable method, will almost invariably reveal some reduction below the normal average.

Albuminuria, the classic sign of nephritis of whatsoever character, cannot be relied upon as an indication in chronic interstitial nephritis. It has been a debated question whether albumin was not sometimes totally absent throughout the disease. There can be no doubt that it may frequently be altogether absent during the early stages, that in other cases it may be absent for long periods of time or until the disease enters the final stage, and that in certain other cases the stage of the disease seems to have little influence in causing albuminuria, the urine apparently remaining free from that body so long as no intercurrent disturbance, apart from the disease, arises to cause it to appear. As the expression of a personal opinion, I would say that in many cases where albumin is apparently absent, it is really actually present, though in minimal amounts only, and these obliterated so far as chemical demonstration by the methods in vogue is concerned, by the dilution of the urine through polyuria.

In such cases its occasional transitory appearance in traces coincides with temporary concentration of urine from physiological or pathological causes. I would further express the conviction that rarely albumin may be absent during the entire course of the disease, in cases of purely cirrhotic type, and only appear in obedience to grave changes in blood pressure, brought about by circulatory causes, or as the result of some intercurrent trouble, apart from the original morbid process.

The albuminuria of chronic interstitial nephritis, even when present, is very irregular, depending upon various physiological factors, such as exercise, character of food, etc., and often at certain times of the day the urine may be free from albumin, although containing it at other times. One is not justified, therefore, in pronouncing albumin to be absent unless a number of samples, taken at different times of the day, have been examined, or better still, a twenty-four-hour collection, submitted to testing.

Without going into the matter further, it may be claimed that the presence of albumin in the

urine in this disease is uncertain, and that it consequently is but a very unreliable diagnostic guide. When present, associated with physical signs and other urinary indications, it serves to complete the diagnosis, but if absent, no contrary inference is justifiable, and the diagnosis must be constructed without its aid. Much more reliable evidence of renal change is the lowered excretion of urea, which may exist months or years before the appearance of albumin, and especially important is the presence of tube casts in the urinary sediment. Casts are undoubtedly present with greater constancy in contracted kidney than is albumin, and in the diagnosis of this disease it may be stated that the morphological evidence afforded by the presence or absence of casts may be accorded more weight than the existence or non-existence of albumin in the urine. While in the main they are associated bodies, casts may be frequently met with when no albumin exists. Albumin without casts is more rare. It is perhaps not too extreme a view to say that chronic interstitial nephritis never exists as a clinically recognizable condition without the presence of casts in the urine. They are most frequently hyaline in character, and, as a rule, exist in small numbers, so much so as to be often difficult of discovery. Patient search for these bodies will, however, always reveal them. Their number bears no relation to the severity of the renal lesion; a desperate organic condition may coincide with casts so infrequent as to be with difficulty found, as in Case II here reported. I do not wish to be interpreted as asserting my belief in the pathognomonic value of casts in the diagnosis of this disease. Although helpful to it, renal diagnosis cannot be founded on casts alone. They do not necessarily mean nephritis, being frequently the product of irritation of the kidneys, by toxic or other causes. I believe, nevertheless, that casts are invariably present when true organic lesions of the kidneys exist. The more purely interstitial the process, the less the tubes are involved in the chronic inflammatory changes the fewer will be the casts. The observations of Defendorf (*Yale Medical Journal*, December, 1902) are of interest, and I may be permitted a reference to them in view of the present tendency to regard hyaline casts as irritation products, not necessarily possessing pathological value, except in the presence of other urinary abnormalities. Especially have they come to be viewed with indifference in individuals beyond middle life, because of their frequency of occurrence. A series of 48 autopsies of cases in which urine examinations had been made some time previous to death showed that purely hyaline casts were present in 41 and chronic nephritis in 47 of the cases, permitting the inference that hyaline casts in these instances were distinctly an indication of organic change in the kidneys.

We have seen that the evidence of chronic interstitial nephritis during the early stage is of two kinds, symptomatic and physical, of which the former is uncertain and not greatly to be relied upon. The physical signs fall naturally into two classes, cardiovascular and renal (urinary). Of the latter, the most important in the general estimation of the profession is albuminuria. This symptom, in many cases, is repeatedly absent in all stages of the malady. Upon what, then, are we to rely for the diagnosis in these doubtful cases? Fortunately we have good recourse, which will undoubtedly suffice in most cases for a satisfactory conclusion. The evidence of cardiovascular changes, arterial tension and enlarged heart, with hyaline casts in the urine and a deficiency of organic urinary excretives, combine to form a symptomatic association which will suffice for a positive diagnosis.

### CONCLUSIONS.

1. Latency of symptoms is so constant a characteristic of chronic interstitial nephritis as to almost constitute its most salient feature. This obscurity involves all manifestations (symptomatic, physical and urinary) and prevails throughout the entire course of the disease.

2. Latency of symptoms does not constitute a point of absolute distinction between the early and the advanced stages or between the mild and severe forms of the malady.

3. Symptoms are especially liable to be absent and urinary signs uncertain during the early stages of chronic interstitial nephritis, consequently the diagnosis during this period must generally be made from physical signs rather than from symptoms or urinary signs.

4. Albumin is absent from the urine of this form of nephritis with great frequency. It may frequently be absent during the early stages. It may occasionally be absent until the disease enters the final stages. It may rarely remain absent from the urine throughout the entire course of the disease, the urine remaining free from albumin so long as no intercurrent disturbance apart from the nephritis arises to cause it to appear. Albuminuria, therefore, constitutes a very unreliable diagnostic sign in this disease. When present, associated with physical signs and other urinary indications, it serves to complete the diagnosis, but if absent no contrary inference is justifiable, and the diagnosis must be considered without its aid.

5. More reliable evidence of renal change is diminution in the gross amount of urinary solids, and especially significant is the presence of casts.

6. Chronic interstitial nephritis never exists as a clinically recognizable condition without the presence of casts in the urine. Although renal diagnosis cannot be founded on casts alone, they constitute a corroborative sign of high clinical value, when associated with other indications.

7. The secondary circulatory changes following chronic interstitial nephritis are so constant and characteristic as to furnish, in most cases, sufficient ground for the recognition of the disease before reference is made to the urine. The inconstancy of the urinary symptoms places them in much the same diagnostic category in chronic in-

terstitial nephritis as that occupied by the murmur in valvular diseases of the heart. The diagnosis should be made, if possible, from the physical signs and symptoms, the urinary indications being regarded as corroborative rather than as essential evidence.

## MEDICAL PROGRESS.

### MEDICINE.

**Roentgen Rays in the Early Diagnosis of Pulmonary Tuberculosis.**—The aid which this measure may furnish in diagnosing the early stages of this disease is made the subject of a paper by W. H. B. Brook and A. S. Green (English Quart. Med. Jour., Aug., 1903). They examined a large number of cases and in no single case where the physical signs pointed to disease have the rays failed to detect mischief. In some cases where the signs have been absent the rays have shown deposits in the lungs, and here physical signs have been subsequently detected. It is also shown that the extent of the disease is in some cases greater than the physician thinks. The progress and results of treatment can be watched with accuracy. The only fallacies may be caused by chalky deposits in the lungs, old healed cavities and thickened pleura, but here the history and the symptoms will help in forming a correct opinion.

**Diagnosis of Renal Tuberculosis.**—The wisdom of basing a diagnosis of renal tuberculosis upon the appearance in the urine of tubercle bacilli is questioned by P. Bazy (Trib. Méd., Aug. 8, 1903); as cases have been seen in which acid-resistant bacilli presenting all of the morphological and chromatic characteristics of Koch's bacilli have been found in the excreta of non-tuberculous subjects. Such a case came under his observation; a nephrectomy for tuberculosis of the kidney having been urgently advised by the attending surgeon. Though examination of the centrifugated urine revealed micro-organisms having the same appearance, staining qualities and resistance to decolorization by acids as tubercle bacilli, their injection into guinea-pigs failed to produce symptoms of tuberculosis; neither did autopsy, performed three months after the injection, reveal tuberculous lesions of any kind. Hence the author holds it to be the part of wisdom and prudence to prove the diagnosis of renal tuberculosis by such experimental injections, in cases in which these bacilli are found in the urine, before resorting to so radical a measure as nephrectomy.

**Specific Gravity of the Blood and Hemoglobin Estimate in Yellow Fever.**—Through a somewhat extended study of the condition of the blood in yellow fever, A. D. Albertini (Rev. de Med. Trop., Vol. IV, No. 7) has found that though the hemoglobin is increased in this condition, the specific gravity varies without any relation to the amount of the former. In illustration of this characteristic he cites a case in which upon the second day the hemoglobin was 92 per cent. while the specific gravity was 1.055; and on the fifth day the specific gravity fell to 1.045, the hemoglobin remaining unchanged. In striking contrast to this condition is the parallelism between hemoglobin and specific gravity in malaria, as demonstrated by Plehn. This investigator also found that while the hemoglobin and specific gravity curve rise and fall together in malaria, in typhoid and dysentery hemoglobin does not change from the normal though the specific gravity is reduced. Albertini believes that a study of the blood's hemoglobin and specific gravity will lend valuable aid to the differentiation of yellow fever and other infectious diseases.

**Leucocytosis Following Endovenous Injection of Bichloride.**—In 15 individuals subjected to endovenous injections of corrosive sublimate, G. Memmi (Gazz. Osped., Aug. 9, 1903) found there was an increase in the number of the leucocytes; in some of these cases the increase reaching from 2,000 to 5,000. This increase was to be seen, as a rule, from an hour and a half to two hours after the injection; reaching its maximum in four to six hours and diminishing from that time till the normal count was regained; this condition being usually reached within eighteen to twenty-four hours. The author believes that the beneficent influence of endovenous injection of bichloride is due to the increased defensive power of the organism, brought about by the leucocytosis it induces; rather than through its antiseptic influence.

**Chylous and Chyliform Exudates.**—After enumerating the varieties of milky exudates and reviewing the literature dealing with their pathogenesis, etc., A. Cipollina (Gazz. Osped., Aug. 2, 1903) gives the case-history of a patient who some years after an attack of pleurisy came under treatment for what appeared to be influenza. In the course of examination a point was reached in the chest which gave the physical signs of fluid, presumably in the pleuritic cavity. Exploratory puncture revealed the existence of a milky exudate of the variety known as chyliform adipose, which, the author believes, had its origin in encapsulation of the effusion which had occurred some years previously; this effusion having subsequently undergone fatty and granular degeneration. Clinical experience, says the author, shows that milky exudates may be met with at any age and in a great variety of conditions; they, however, show a predilection for patients afflicted with malignant tumors and serious tuberculous lesions. Their symptomatology is that of all exudates, save that in chylous ascites there may be signs of peritoneal inflammation. Chylous ascites is very abundant and the fluid reaccumulates rapidly and repeatedly after puncture. The prognosis in this form of ascites is always grave.

**Course of Diabetic Coma.**—Coma, as the fatal issue of diabetes presents itself, is one of the most important symptoms of the disease, and has been observed as a terminal symptom frequently in severe cases of the affection in young persons. V. T. Orlovsky (Roussky Vratch, No. 30, 1903) observed 3 cases of diabetic coma, and finds that notwithstanding the introduction into the organism of considerable quantities of fluids hypodermatically and through clysmata, the amount of urine may become considerably diminished, while its specific gravity is but little lowered; the amount of sugar in the urine is at times increased, at other times diminished; though the daily total may at times diminish very considerably. Typical diabetic coma accompanied by air "hunger" may develop even in those patients in whose urine there had been no dextrose for some time, nor during the attack of coma; the latter was, however, observed in but one single case, in whom the disappearance of sugar in the urine for seven days previous to the attack the author ascribes to the extreme anemia which is usually accompanied in severe cases by a diminution in the amount of sugar in the urine, and sometimes by its entire disappearance, due evidently to disturbances of the alimentary functions, and smaller quantity of food ingested. The real nature of the coma as it presented itself, could only be defined from the observation of the course of the disease in the hospital, for the character of the urine during the attack furnished no positive indication of the presence of diabetes mellitus. Contrary to Naunyn,

the author observed a considerably slower and deeper respiration.

**Diagnosis of Liver Abscess.**—Until not so very long ago, the diagnosis of liver abscess was difficult and surgeons often waited until the abscess was very large or matastases had formed in the liver, before operating. D. Schlayer (Münch. med. Woch., Aug. 11, 1903) points out the importance of counting the white cells, by the absence of a leucocytosis he could rule out a number of cases of typhoid, malaria and nephropyelitis which closely simulated hepatic abscess. It is not proper to depend solely upon the number of leucocytes in deciding when to operate and the temperature and local symptoms must also be taken into account. After an abscess has been opened, all the symptoms generally disappear, so that the diagnosis of a second abscess may be impossible. Here again a leucocyte count proves invaluable. The white cells generally sink very slowly; if they remain high for several days and complications can be ruled out, it is probable that there is another focus in the liver. The temperature curve is less reliable, since even with complete evacuation of pus there may be quite a post-operative rise. Larger abscesses, requiring further operation will generally show more than 20.000 leucocytes; the smaller ones with 15.000 to 20.000 cells will often be absorbed spontaneously or become latent. An exacerbation of a dysentery or peritonitic processes may also be the cause of leucocytosis.

**Fallacies of the Widal Reaction.**—It is well-known that a small amount of bile in the blood will give a positive agglutination, even in patients not suffering from typhoid. F. Köhler (Münch. med. Woch., Aug. 11, 1903) could even bring about an artificial agglutination by ligating the common bile duct and by injecting taurocholic acid into the blood. There is no doubt that normal serum, and more often the serum of patients suffering from blood-diseases or from disturbances of the liver with jaundice, will cause clumping of typhoid bacilli in relatively high dilution. Human bile, even when heated for two hours at 60° C., and taurocholic acid, when added directly to a culture, will also agglutinate this but the phenomenon is by no means constant. A number of chemical substances such as salicylic acid, safranin, fuchsin, etc., will behave in the same way. A positive Widal is, therefore, not pathognomonic for typhoid: it may also be due to (1) disease of the liver with biliary stasis and bile in the blood; (2) chemical substances; (3) infection with the colon bacillus; (4) rarely other infections such as with the pneumococcus and meningococcus.

**Phlegmonous Gastritis.**—It is often difficult to ascertain the cause of gastric abscess and in the case observed by C. Kleineberger (Münch. med. Woch., Aug. 4, 1903), iodide of potassium must be held responsible. A strong man of advanced years receives less than a dram of this drug within three days, for emphysema and chronic bronchitis. Soon severe iodine poisoning makes its appearance and with it, gastro-intestinal disturbances of a serious character followed by peritonitis, collapse and death. At autopsy, the abdomen was found filled with pus and the entire stomach wall was the seat of suppuration. The patient's previous history was negative, especially in reference to the intestinal tract. It follows that in cases of iodism some attention should be given the stomach and gastric lavage may often be indicated.

## SURGERY.

**Traumatic Hydronephrosis.**—A boy, twelve years of age, was struck by a horse's hoof in the left side, and soon after began to vomit, and complained of extreme pain all over the abdomen; urine tinged with blood; the same on the next day. The abdomen was somewhat distended, and tender on pressure, especially on the left side. The patient improved so well in the course of a few days that he was discharged from the hospital to be readmitted, however, in two weeks, with still greater abdominal pain, and a marked swelling occupying the whole of the left costal space. The nature of the swelling—its fluid contents, definite boundaries not disturbed by moving the patient about—suggested to I. G. Ryaboff (Roussky Vratch, No. 30, 1903) a circumscribed collection of fluid in the abdominal cavity, a cyst developed immediately after a trauma with a tendency to rapid enlargement. The anamnestic data, especially as regards the admixture of blood in the urine, pointed to a possible hydronephrosis of the kidney. On performing a nephrotomy, and the fluid having been removed, a soft mass was felt by the examining finger which turned out to be clotted fibrin that closed up tightly the ureter and thus evidently served as the cause of the hydronephrosis. The pelvis was carefully cleaned, and the cut surfaces of the kidney were stitched to the edges of the skin wound, while a drainage tube was introduced into the pelvis connected with a vessel containing a solution of boracic acid. On the fourth day after the operation the stitches that united the edges of the incised kidney to the skin were removed, and a larger drainage tube introduced. During the first few days about 100 c.cm. of urine was excreted through the drainage tube, but by the sixth day this amount diminished to 40 c.cm. The drainage tube was removed on the ninth day, and the opening was soon closed. The first few days only 450 c.cm. of urine were excreted through the urethra, but this quantity soon increased up to 900 to 950 c.cm. The urine was at first turbid, with a considerable sediment, but without any admixture of blood; it gradually cleared up, until it finally became limpid. Temperature was normal all this time. The kidney gradually returned to its former natural size until, before the patient's discharge, it could hardly be palpated. Patient was discharged entirely cured. The rapid and certain success of the operation is due, according to the author, to the permeability of the ureter, which corroborates the view that the hydronephrosis was due to the closure of the ureter by the coagula of fibrin brought on by extravasated blood under the influence of the trauma.

**New Operation for Caput Obstipum.**—Dividing or extirpating the contracted sternocleidomastoid is generally not sufficient to cure a wry-neck, since the opposite muscle is elongated so much that it cannot carry out normal rotation, where the difference between the two muscles is more than four centimeters. L. Wullstein (Centralbl. f. Chirurg., Aug. 15, 1903) shortens the stretched muscle by means of sutures placed beneath the entrance of the spinal accessory nerve. Simple resection is contra-indicated, since the lower portion of the muscle would lose its innervation. The bandage is generally kept on for twenty days, after which slight movements are permitted. The only objection to this method is that two skin incisions are necessary.

**Operation for Femoral Hernia.**—In elderly people and in cases of incarceration, J. Gilli (Centralbl. f. Chirurg., Aug. 8, 1903) modifies Lotheissen's method for femoral hernia as follows: The skin is incised parallel to Poupart's ligament, the lower flap of skin pulled downward and the sac dissected to the edge of the fossa ovalis. This is followed by splitting of the aponeurosis of the external oblique and displacement of Poupart's ligament. A Kocher's sound is then passed upward at the upper edge of the external hernial ring

between sac and plica falciformis, till it appears on the abdominal side of the inguinal ligament, corresponding to the inner hernial ring. Upon this sound the ligament and plica are divided transversely. After all spurting vessels are caught (such as an abnormal obturator artery or a large anastomotic vessel between obturator and inferior epigastric) the thickened fascia propria surrounding the neck is split, when the sac will be completely free. After this the hernia is reduced and the opening closed in the ordinary way. By this method the constricting ring is severed under complete control of the eyes and hemorrhages difficult to check are avoided. By completely unfolding the neck of the sac, the abdominal cavity can be opened above it and its contents tamponed off, before the sac itself is opened, thereby avoiding a peritonitis in strangulation. The operation can be performed under local anesthesia even in sensitive people.

**An Aid to Narcosis in Ileus.**—The question of narcosis in cases of intestinal obstruction and ileus has been attended with many difficulties, chief among which has been the danger of an aspiration pneumonia. Especially in the case of an ileus where operation may have to be undertaken without previous preparation, regurgitated materials may be inspirated even after the stomach has been washed out. The attempt has been made of leaving the stomach tube in situ during the anesthesia, but it was found that the gastric contents passed alongside as well as through it. In order to obviate this difficulty, an ingenious apparatus has been devised by W. KAUSCH (Berl. klin. Woch., August 17, 1903). It consists of a soft rubber stomach tube near the distal extremity of which is fastened a rubber balloon, which when dilated has a diameter of 7 cm. From this leads a thin rubber tube somewhat longer than the stomach tube, which is connected with a similar balloon. This contrivance is introduced into the stomach in the usual way before narcosis is begun, with the balloons collapsed. The latter are then inflated and a clamp placed on the tube beyond the second. The anesthesia is then continued, while sufficient traction is exerted on the affair to keep the inflated balloon at the cardia of the stomach. In three cases of ileus in which the author tried it, a lot of fecal material was discharged through the stomach tube but none alongside which could have possibly entered the larynx. Another advantage claimed for the contrivance is that the upper part of the gut may be cleared of its contents without making an opening, by merely squeezing the contained materials into the stomach, from which they can readily find their way out through the tube. A metal clamp, properly protected with rubber, is placed around the tubes where they come into contact with the teeth, so that compression from the latter is avoided.

**Surgical Treatment of Trifacial Neuralgia.**—A method of treatment which follows closely that of Durante and Thiersch and which combines nerve stretching and resection is thus described by G. BARONI (Gazz. Osped., Aug. 2, 1903). The trigeminal nerve is exposed for as great a length as possible and isolated. The nerve is then seized with pincers at the angle of the wound in the soft parts corresponding to the center of the nerve and gentle traction is exerted upon it. Gradually the nerve is seen to be stretched and drawn outward. It is again seized with the pincers near the angle of the wound and more energetic traction causes it to be severed some distance from the point at which it is held by the forceps. This same maneuver is repeated at the opposite angle of the wound, that is toward the peripheral portion of the nerve. In this manner a larger portion of the nerve is removed than could be accomplished by simple resection; for not only is that part accessible which is uncovered by the incision, but an additional portion is drawn out by the movements of traction and the section occurs nearer the ganglion. Furthermore, the beneficial effect of nerve stretching is attained by the same means through which the section is accomplished and simultaneously with it.

**Murphy Button in Stomach and Gut Operations.**—The interest in this subject remains unabated. In a leading article of almost 100 pages O. NEUWEILER (Archiv f. klin. Chirurgie, Bd. 69, Heft IV, 1903) gives a critical review of all recent literature concluding in this volume the able article of the previous issue. He concludes that perforation resulting from the use of the Murphy button is particularly prone to occur after union of the small gut following resection for incarcerated hernia; in certain gastro-enterostomies and particularly after circular iliocolostomies. In many cases the blame for the perforation lies in faulty technic or in the use of worthless buttons. In hernia, the cause of perforation lies more in the already existing infection than either in bad technic or faulty button. This is shown by the fact that union by suture yields no better result. This is, therefore, no just arraignment of the button principle. Before using a button the following conditions should be fulfilled: (1) The margins of the ring which are designed to hold together the serous surfaces on the male side and all marginal holes must not be sharp but evenly rounded off; (2) the opening between the cylinder and ring of the female side must be wide enough to admit a thick gut wall; (3) the cylinder of the female part must be somewhat shorter than that of the male or that a complete locking of the two parts may be possible; (4) the male cylinder, when the button is closely pressed together should not overreach, lest, with the fingers closely pressed over the openings, its margin may seriously wound the mucous membrane of the gut; (5) the strength of the spring must be such that the pressure will be absolutely continuous so that necrosis will occur early; (6) the size of the button must be in proper relation to the size of the gut. Touching on the technic of inserting the button he notes the following points: (*a*) The purse-string suture should not be placed too far from the edges of the gut lest a cuff result too large to be accommodated by the button; (*b*) Similarly this stitch shall not be placed too near the edge for fear of tearing out when the button is pressed together. Two to three mm. from the edge seem the best average distance; (*c*) In circular anastomoses care must always be taken that the stitch holds the mesentery close to the button so that at this point only serous surfaces shall be brought together; (*d*) Protruding mucous membrane should always be resected; (*e*) The closure of the button should not be accomplished by a single push but by several. The fingers should be so placed as not to wound the mucous membrane upon the margins of the lumen; (*f*) In most cases a protecting reinforcing line of suture should be used.

**End to End Union of Arteries and Veins.**—The literature of this interesting problem is not as yet very full. A valuable contribution to it has been made by GEORG JENSEN (Archiv f. klin. Chirurgie, Bd. 69, Heft IV, 1903) which won for him the gold medal at the University of Copenhagen. His most important conclusion is that in those cases in which union is sought to be established by the use of sutures alone, without the introduction upon the intima of any foreign body, thrombus formation is entirely dependent upon bacterial infection. His experiments were conducted entirely upon horses and goats. He sutured, as a rule, the veins and arteries of the neck. So far as infection went his

results were somewhat discouraging, he having found it very difficult to keep the horses infection-free. He has devised a method of suture which differs somewhat from that of Glück, Murphy and Payr. Upon a ligature of fine silk he threads two needles. As much as 2 cm. of the vessel may have been resected. He consumes but 1 mm. at the end of each segment of vessel in making his stitch. This is a great improvement on other technics. From without in, through all coats, he passes the needles on the proximal side, from within out, on the distal fragment, they are driven 1 mm. from the margin. He used in his primary operations from 12 to 14 of these U-shaped stitches. His most recent modification is simply to pass two such stitches and then complete the sewing of the invaginated parts with a circular stitch. He concludes that in the absence of infection there should be no thrombus formation nor invalidating narrowing of the vessel's lumen.

## HISTOLOGY, PATHOLOGY AND BACTERIOLOGY.

**Hemorrhagic Gastritis Due to a Laryngeal Pseudomembrane.**—The specimen demonstrated by A. G. ELLIS (Proc. of the Path. Soc. of Phila., June, 1903) was removed from the body of a child seven months old who had stomatitis and pharyngitis and who died with signs of tuberculous meningitis. At the pylorus there was found a plug of soft material, consisting of fibrin. Removal was easily accomplished but where it had been in contact with the gastric mucosa, the latter was considerably eroded. That this pseudomembrane had been formed in the respiratory passages was proven by the presence of small islets of tissue containing ciliated epithelium. A large number of diphtheria bacilli were also found.

**The Structural Changes of the Pancreas as Related to its Functional Condition in Normal and Spleenless Dogs.**—The histological appearance of the secretory cells of the pancreas, according to G. FICHERA (Beiträge z. Path. Anat., Vol. 34, No. 1), shows in the different stages of digestion and in the fasting condition, the same changes in spleenless as in normal dogs. At the same time the tryptic zymogen is produced irrespective of the presence or absence of the spleen. The islands of Langerhans display in the different periods of digestion functional and morphological changes which are the same in normal and in spleenless dogs; the ablation of the spleen has, therefore, no influence upon the function of the islands. The epithelium of the pancreatic ducts is furnished with the power to secrete. The spleen produces, particularly during the period of digestion, an oxidizing ferment, which during this period is sent in large quantities into the circulation; from this as the result of certain changes in the epithelium of the pancreatic ducts, the ferment passes into their lumen. In the latter it exerts its activity, transforming the pancreatic zymogens and rendering possible the characteristic proteolytic properties of the pancreatic juice. Of extreme interest is the fact that in spleenless dogs the capacity of the epithelium of the pancreatic ducts to secrete is markedly disturbed. In splenectomized dogs the pancreatic juice has no effect on albuminoids, since the removal of the spleen has deprived the above-mentioned secretion of every oxidizing capacity. The pancreatic juice is robbed of its most important and most specific constituent.

**Mechanical Obstacles in the Intestines and the Excretion of Indican.**—The observation made by Jaffe, that obstipation in the small intestine produces a marked increase in the excretion of indican, while a similar condition in the large intestine produces no such increase, is confirmed by A. ELLINGER and W. PRUTZ (Hoppe-Seyler's Zeitschrift, June 19, 1903). An increase of indican accompanying obstipation in the large intestine is to be attributed to an extension of this condition to the smaller gut. The authors believe that no precise diagnosis of the functional capacity or patency of the ileocecal valve is possible without an exact quantitative determination of the indican. The clinical symptoms of intestinal occlusion frequently come on acutely, although some obstacle may have been present in the intestinal canal for some time. It should be the province of clinical investigation to determine whether or not repeated measurements of the indican content would give early knowledge of an increasing stenosis in the gut, at a time when, without such determinations, the slight and uncertain symptoms would only warrant at best a supposition as to the real condition. The researches of the authors prove that the narrowing of small portions of the gut, at least in the dog, produces marked changes in the indican.

**Soap as Disinfectant.**—Green soap has only a slight disinfecting power, according to O. HELLER (Arch. f. Hyg., Vol. 47, No. 3). Combined with crystallized carbolic acid in the proportion of 1 : 3 it forms a solution at room-temperature and increases the disinfecting power of the acid. Typhoid germs are killed by a five-per-cent. solution of phenol, but if green soap is added, a four-per-cent. solution will have the same effect. Soapy solutions of cresol, such as lysol, therefore do not only permit a higher concentration of the relatively non-poisonous cresol, but also make it a better disinfectant. The real cause of this is not yet explained, but possibly a new compound is formed by the interaction of soap and cresol.

**Syphilis in Apes.**—The successful experiment of inoculating syphilis into a chimpanzee after many unsuccessful attempts with other members of the monkey family was reported to the Academy by ROUX and METCHNIKOFF (Gaz. med. de Paris, Aug. 8, 1903). Great bacteriological and therapeutical discoveries are expected from this achievement. Unfortunately large sums are necessary to carry out these experiments, since the chimpanzee is an animal very difficult to capture.

**Tubercle Bacilli in Milk.**—The preliminary report of W. RULLMANN'S experiments upon the effect of prolonged heating at a low temperature upon the tubercle bacilli in milk is found in the Münch. med. Woch., Aug. 4, 1902. It may be stated conclusively that heating for half an hour up to 65° C. does not kill the germs for the inoculated guinea-pigs invariably became tuberculous, even when the milk was thoroughly shaken. Experiments showing the effects of an hour's heating are not yet concluded but it is certain that the milk does not suffer in taste or digestibility by this process.

**Experimental Lead Colic.**—It is impossible to obtain a clear idea of the pathological changes in the ganglion cells of the celiac plexus in lead colic from the studies hitherto published, so that M. MOSSE (Zeitsch f. klin. Med., Vol. 50, Nos. 1 and 2) repeated the experiments on rabbits with an organic salt of lead. Metallic lead was found deposited in the cells and certain pathological changes were noted, but these were also found when other substances which cause contraction of the gut (berberine) were injected. The lesions must therefore be looked upon as resulting from excessive intestinal contraction. They are not characteristic for lead and do not explain the abdominal symptoms.

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## SPECTACULAR THERAPEUTICS.

The world of music will probably never know what it lost in the failure of Richard Wagner to supply himself with a pair of American spectacles. This is all the more lamentable in view of the fact that the contributions of America to the art of music have been rather meager, and that if the great Baireuth composer had only used a pair of Yankee eye-glasses, we should have had some right in this country to claim a share in the evolution of his eternal harmonies.

This is now, of course, a vain regret; but if the world of music has lost something, the world of science has gained much: for we owe it to the lucid writings of an American ophthalmologist that genius need no longer be handicapped by the want of appropriate goggles. In fact, genius without its spectacles will probably be as rare hereafter as a day in June, for with the frightful examples before us not only of Wagner but also of Darwin, Huxley and Carlyle, it is safe to say that no man of genius will henceforth be allowed to appear in public with his eyes uncovered. We could no more tolerate it than the Mohammedan could allow his women to go unveiled. The public would probably arise as one man and exclaim to such a rash man of genius: "Remember Wagner, remember Darwin, remember Huxley, and get thee to an ophthalmologist!"

The disadvantages of this state of things may be that some upstarts, who wish to palm themselves off as men of genius, will take to wearing spectacles, and so try to impose upon the world. It might be difficult, in fact, for non-experts to distinguish the musical compositions and scientific monographs of such upstarts; the very fact that these pseudo-genii wore spectacles would be confusing. But we should probably be safe in relying upon the ophthalmologists to give us some test or sign by which we could distinguish the true from the false, for these eye-specialists would doubtless be called upon to examine many more eyes than ever, and if reasonable fees were secured by them, they might establish a critical bureau of their own to announce to the world what are the real and what are the spurious men of genius. We doubt not that it would be easy to select an American ophthalmologist who would be an admirable chief for such an ophthalmological bureau of universal criticism.

The possibilities of good that open before the mind's eye from having all our men of genius wear spectacles are innumerable, and vastly greater than we have time or space to depict. What would not evolution have been by this time if Darwin had only worn specs? Is it too much to claim that he might have discovered the missing link? To what sublimity of style would not Carlyle's scolding have mounted if only he had had a pair of American eye-glasses that were warranted not to fall off his nose? Is it too much to suppose that even Froude, when he wrote the biography of the sage of Chelsea, might have discovered the exact form of insanity from which Mrs. Carlyle suffered, because her husband had asthenopia? What would not Huxley have accomplished with the bench of Anglican bishops if he could have had a better shot at them through a pair of Philadelphia spectacles? Is it too much to believe that he would have turned them all into agnostics, to the lasting satisfaction of himself and the scientific world? What would not society have gained if Wagner could have corrected the acoustics of his presbyopia with a pair of ten dollar lenses with gold rims? Is it too much to suppose that his audiences might get home in time to go to bed before half-past midnight? These are but few—very, very few—of the unspeakable advantages that would have accrued from attending to the refraction of refractory men of genius.

For ophthalmology the gains from this discovery will be ever greater than for the world at large. We do not mean the pecuniary gains, for, of course, these do not enter into consideration; but we mean the elevation of that specialty from being a mere branch of the science of medicine to the supreme height of being an arbiter of the productions of genius and an adjuster of spectacles to the nose of genius itself. This is indeed a destiny.

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### TUBERCULOSIS IN MAN AND IN ANIMALS.

The widely advertised pronouncement of Koch while in England a few years ago, as to the difference between human and bovine tuberculosis, excited scientific interest all over the world, and caused the foundation of a special Investigation Commission attached to the Berlin Sanitary Bureau. The Commission was greatly assisted in its laudable work by the German authorities, and the results of its labors have been embodied in a report presented the other day by its chief, Prof. Kossel, before the Berlin Medical Society.

The communication treated, first, of the results obtained by the subcutaneous injection of tuberculous virus, derived from pigs and cattle, into cattle. In order to avoid the possibility of mixed infection a pure bouillon culture was employed instead of the matter directly from the infected animal. The site of the inoculation swelled perceptibly, attaining in the course of a few weeks the size of one's palm; on the eighth to tenth day the nearest lymphatic glands became involved, and in many instances attained the size of a child's head. Fever was observed the eighth day after injection. On autopsy the contents of these glands were found to consist of cheesy matter, while the rest of the body contained abundant miliary tubercles.

The experiments with human virus in the form of cultures made from sputum and pulmonary tissue, gave the following results: Both the swelling at the site of inoculation, and the enlargement of the adjacent lymphatic glands were considerably smaller than in the former experiments. At the autopsy of animals four months after inoculation, living bacilli could be detected at the site of the injection, while the contents of the glands consisted of small, circumscribed foci of cheesy matter; no miliary tubercles were found anywhere on the body. Inoculations were also made with bacilli from tuberculous bones, tuberculous cervical glands, and from one case of tuberculosis of the genito-urinary tract.

The sum total of the experiments with human tuberculosis embraced 39 different cultures, 23 from adults and 16 from children. Nineteen of these cultures failed altogether in producing any marked changes in the inoculated animals; nine caused the appearance, in the course of four months, of small infectious foci in the nearest lymphatic glands, but without any further spread of the disease, in seven other cases there was a somewhat more considerable affection of the lymphatics, and only four cases in which the inoculation was made from the virus of children was there noted a general infection. The conclusion drawn was, that notwithstanding Koch's view of the small danger of transferring bovine tuberculosis to man, a few of the cases in which this danger became a reality should serve as a warning against the use of raw milk from infected animals as a food for children.

In the very animated discussions that followed the report, Prof. Orth, Virchow's successor at the Berlin University, called attention to the fact that extreme caution should be exercised in drawing conclusions from observations on the transmission of tuberculosis from animals to man. He referred to the statement of Schütz (Koch's co-worker in the Veterinary Institute) that the pearly distemper of cattle (bovine tuberculosis) may, though very rarely, be transmitted to man. The observation that those working over cadavers of cattle less frequently became affected with what is known as the cadaver tubercles of the hand, than those who perform autopsies on human beings is, according to Orth, due to the fact that cattle in general suffer less from tuberculosis than man. Moreover, it remains yet to be proven that this affection is really of a tuberculous nature. It is quite likely that we have to do here with a form of mixed infection. The differences in the pathological anatomy of tuberculosis in man and that of the pearly distemper in cattle are accounted for by the differences in the anatomical structure, for it is a well-known fact that the same infectious principle presents a different pathological and clinical course in different living beings. It is sufficient to compare tuberculosis in man and in the guinea-pig.

Domesticated animals, such as goats and pigs, are easily susceptible to human tuberculosis, as Schütz himself proved some twenty years ago. Orth inoculated five calves with human tuberculosis, and of these, two fell victims to a severe form of general tuberculosis. The data communicated by the Sanitary Bureau go to show that

ten per cent. of all inoculations of cattle by human tuberculosis resulted in severe forms of the disease; twenty-eight per cent. of the cultures of tubercle bacilli from man turned out to be pathogenetic for cattle. Koch and his followers assert that tuberculosis which is transferred from man to cattle is not human tuberculosis but the "pearl disease." If that be the case, then it is clear that man may become infected from cattle and vice versa, and all the measures adopted hitherto to prevent the spread of the infection from cattle to man must remain in their present force.

The discussion on the subject became so heated that in replying to Prof. Schütz, Dr. Orth was forced to confess his astonishment at the attitude of Koch's followers who have tinctured the question with a peculiarly personal element as if defending the personality of Koch himself. The fame of the great bacteriologist, as Orth well remarked, is so firmly established that it would not suffer a whit even if he acknowledged that he had committed an error; for in scientific questions truth must stand above every other consideration: *Amicus Schütz, amicus Koch, sed magis amica veritas.*

## PROLONGATION OF HUMAN LIFE.

ACCORDING to the last census the average length of human life in the United States had increased during the previous ten years from somewhat less than thirty-two years to nearly thirty-six years. There are those who doubt the value of census statistics in matters of this kind and who consider that many variable factors enter into the problem of vital statistics and that so much improvement has occurred in the gathering of these data in recent years that the results may, after all, mean very little in the concrete and only indicate a better state of knowledge rather than a better state of health. To such doubters it will be interesting to learn that the actuaries of the life insurance companies of the world, in their meeting here in New York, last week, were agreed that there has been a very notable lengthening of the average of human life, during the latter part of the nineteenth century. As on the calculations of their actuaries depends the rate for life insurance which the companies must charge, in order that their business may not be a losing venture, it seems very evident that the lengthening of human life is no mere theoretical consideration but is an actual fact on which serious-minded business men are satisfied to risk money.

A number of communications, read before the meeting, showed that the principal reason for the lengthening of human life is to be found in the lessened death-rate from contagious diseases. Epidemics of cholera, which were a matter of constant recurrence every ten years, if not oftener, in the early part of the nineteenth century, in many cities of the old and new world, are now definitely a thing of the past. Yellow fever is another of the diseases whose mortality has been very decidedly decreased during the last half of the nineteenth century.

It must not be forgotten that cities so far north as Philadelphia, New York, and even Boston, were liable to recurring epidemics of yellow fever, that made great havoc especially among the poorer population. This improvement in vital statistics is undoubtedly permanent and makes the problem of life insurance much simpler than it was even fifty years ago.

It is, however, among children especially that the lessening of the death-rate has brought about a definite increase in the length of life. Children are more likely to contract contagious disease than are adults. The statistics show that in the last thirty years the mortality of such diseases as scarlet fever, whooping-cough, diphtheria and the diarrheal diseases of children have been very materially reduced. Curiously enough the mortality from measles remains nearly the same as it was quite half a century ago. This seems to be because pneumonia is a frequent complication of measles. As is well known, the death-rate from pneumonia has surely not been decreased in recent years and has probably even increased in spite of every effort on the part of medical men and the most careful study of the disease, its possible prevention and methods of treatment. It is in the group of infectious throat diseases that the most striking diminution of mortality has occurred. The death-rate from diphtheria is now probably less than one-third the rate of fifty years ago. Those who are opposed to the use of antitoxin may well read a lesson for themselves in this fact.

As the data become more definite and more complete in recent years the reduction in mortality becomes more evident. Each year of the last decade, for instance, has shown a definite amelioration in the death-rate not only as regards the country at large, but especially as regards city life in various parts of the country. If such widely separated cities as New York and San Francisco, Boston and Savannah, Lowell and Baltimore, Brooklyn and Pittsburg, be considered, it is found that not only during the last five

decades has there been a constant decrease in the city's mortality rate, but that this is especially noticeable in the last decade when the more careful collection of statistics might have made the death-rate appear comparatively higher than in the earlier years, when so much diligence in collecting death reports was not employed. It is very interesting to find that at last there is to be a definite recognition on the part of those outside of the medical profession of how much modern medical science has done to make life less full of suffering as well as actually longer.

A great deal remains to be done, however, for with regard to certain diseases there has been no improvement in the mortality notwithstanding all the advances in medicine. In certain diseases the conditions seem to be actually worse than they were half a century ago, and the death-rate from them is higher. While such city scourges as smallpox, typhoid fever, and tuberculosis are much reduced in mortality, pneumonia has certainly not lost any of its fatality and cancer is actually much more extensively fatal than with past generations. As a matter of fact, cancer at the present time accounts for as many deaths in our cities as do all of the infectious diseases taken together, with the exception of those which affect the respiratory tract. Cancer mortality has more than doubled during the last thirty years. Evidently the studious attention of the present generation must be concentrated upon these maladies if we are to continue the work that the last generation accomplished so successfully. The very fact that while the sanitation of cities has decreased the death-rate for infectious diseases it yet has allowed that from cancer to increase may point to the fact that all of the investigations thus far undertaken with regard to cancer have been misdirected. In any case, this is the problem that must be faced. Let us hope that its successful solution is near at hand.

## ECHOES AND NEWS.

### NEW YORK.

**Opening College of Physicians and Surgeons.**—The opening exercises of the academic year 1903-4 will be held in the Lower Lecture Room on Thursday, September 24, 1903, at three o'clock p. m. After a brief address of welcome by the President of the University an address will be delivered by Walter B. James, M.D., Professor of the practice of Medicine, upon "The Old and the New Medicine."

**Medical School Inspectors Appointed.**—Health Commissioner Lederle appointed recently about 50 physicians to make up the corps of medical school inspectors for this borough. About 25 were appointed for work in the other boroughs. The number of medical school inspectors will be smaller than usual this year because of lack of funds to employ them. They will begin work on September 21.

**New Gouverneur Hospital to Be Completed.**—Plans have been filed with the Building Bureau for the completion of the new Gouverneur Hospital at Gouverneur Slip, running through the block from Front to Water street. The plans provide for the west wing to the present five-story and basement main building, also for a one-story extension into the rear courtyard and for a two-story ambulance station, with a stable, fronting on Front street. The completed building will be of brick, stone and terra cotta, 116 feet front, and have two wings, each 140 feet deep and when finished and equipped will have cost about half a million dollars. The west wing and extension are to cost $250,000 and the ambulance station an additional $25,000.

**Sterile Milk and Infant Mortality.**—The summer pasteurized milk depots maintained by Nathan Straus closed on Saturday, having dispensed more pasteurized (sterilized) milk than in any previous year since the beginning of the work in 1892. Much of the success of the season's work was due to the earnest cooperation of the Health Department. At the beginning of the summer season Dr. Lederle caused cards of instruction as to the proper feeding of infants to be displayed in every tenement in the city. These cards gave the location of all the Straus milk depots, and were in the nature of an educational propaganda making for good health among the tenement dwellers. All the members of the free corps of physicians of the Health Department carried gratuitous coupons for pasteurized milk, which they distributed where needed. These depots will remain open throughout the year: At 151 Avenue C; 45 Monroe street; 241 East Fifty-ninth street, and 235 West Sixtieth street. At these depots all gratuitous coupons will be honored. The depots in the playgrounds of the public schools were a new feature of the charity this year. They were so placed at the request of the Board of Education. The comparatively low death rate prevailing in New York among infants in recent years has caused other large cities to look for the cause, with the result that the present season has also seen the establishment of pasteurized milk dispensaries in Chicago and Philadelphia, modeled after the plans of Mr. Straus in New York. In both these cities Mr. Straus gave the plant for pasteurizing. With the increase from year to year of the amount of pasteurized milk dispensed, a marked and consistent decrease in the death rate of children under five years of age has been noticeable. In 1891 the death rate for children under five years old during June, July and August was 126 per thousand. In 1897 it dropped to 91.3 per thousand. This year it was only 63.6.

**"The Malaria Map."**—Of course, according to the recent explanation of the causation of malaria, this must be in some degree regarded as a misnomer, but that it still exerts a potent influence is very apparent to the real estate agent. The correct and official name of the map is, "A Topographical Map of the City of New York," and it was prepared by the late Gen. Egbert L. Viele for the Council of Hygiene and Public Health of the Citizens' Association in 1865. It has been adopted by the Health Department of New York, and copies of it are to be found framed and hanging on the wall of many physicians' offices. The map shows the Island of Manhattan as it was before the Dutch settlers bought it from the Indians and as it was in 1865. That is to say, underneath the labyrinth of streets are represented the hills and

valleys, the swamps and meadows, the streams and water courses as they were before the leveling hand of the street-maker and house-builder made the whole island a monotonous wilderness of brick, mortar, block pavement, and asphalt. Some of the tales told by this map are revelations to those who know only the New York of to-day. Of course every old New Yorker knows that the Tombs stands on the site of the old Collect Pond, and that Canal street was once the bed of a canal, but how many know that West One Hundred and Sixth street was once the bed of a river, and that the hill between Columbus and Amsterdam avenues is caused by the masonry of the abandoned aqueduct? How many remember now that the territory from Eighty-fifth to Ninety-fourth street, between Central Park West and the Hudson, was once rolling meadow land, and that from Ninety-fourth to One Hundred and Second street was a region of swamps, cut up by numerous small streams? Who can tell now that from One Hundred and Fifth to One Hundred and Eleventh street on the west side was a region of rocks and hills, with brooks and rivulets everywhere, so that, while one house may be on a rock foundation, the next one to it may have a cellar constantly wet from the forgotten brook which flows under it? All the streams of this section were tributary to a good-sized river which flowed into the East river in the neighborhood of Ninety-sixth street. All this is told by the "malaria map." Perhaps this will explain to some landlords why apartments which are cheap and apparently in every way desirable are rejected after a list of streets has been consulted by the prospective tenant.

**Experimental Work at Cornell.**—The Cornell University Medical College in New York City has provided for a Chair of Experimental Pathology and Bacteriology, to carry on research work, independently of the regular instruction given to undergraduates. Dr. B. H. Buxton is to be in charge and will be assisted by Dr. Victor C. Vaughan, Jr. The pathological organic chemistry, so intimately associated with all the problems of disordered metabolism, will be under the direction of Mr. Beebe. This work is to be entirely distinct from all undergraduate or postgraduate instruction and purely for the advancement of scientific knowledge, and is to be conducted in the Loomis Laboratory, a building originally designed especially for this purpose.

## PHILADELPHIA.

**Officers of Cumberland Medical Society.**—At the organization of the Cumberland Valley Medical Society, held at Mount Alto Park, September 8, the following officers were elected: President, Dr. R. W. Ramsey, Chambersburg; Vice-Presidents, Dr. James Elvy Hilser, Carlisle; Dr. T. H. Weagley, Marion; Dr. J. W. Humrichouse, Hagerstown, Md.; Secretary, Dr. J. J. Coffman, Scotland; Assistant Secretaries, Dr. R. A. Mille, Carlisle; Dr. P. B. Montgomery, Chambersburg; Treasurer, Dr. J. H. Montgomery, Chambersburg.

**Charter Obtained by Phipps Institute.**—A charter has been granted to the Henry Phipps Institute for the Study, Treatment, and Prevention of Tuberculosis. The managers of that institution are now in position to purchase property and erect permanent buildings to carry forward the work recently begun in a small way at a temporary location on Pine street. The directors chosen to act for the first year are Henry Phipps, George E. Gordon, of New York, and Dr. Lawrence F. Flick. Amy F. Phipps and Samuel B. Harbison, of Pittsburg, in conjunction with the three directors, are named as subscribers. The site for the permanent location of the institute has not yet been finally selected.

**No Vaccination in Schools.**—The visits to schools by the district vaccine physicians have been discontinued while arrangements for inspection of the children's vaccination marks are being made by the Committee on Hygiene of the Board of Education. It is thought that arrangements can be made whereby all children not vaccinated within five years or having deficient marks may be revaccinated by the family physicians of their parents. The inspection will be made by physicians who are members of the school faculties or by volunteer physicians appointed by the Board. It is understood that the school controllers will in every instance prohibit the vaccination of pupils in school buildings.

**Marriage of Dr. Flexner.**—The marriage of Dr. Simon Flexner and Miss Helen Thomas, of Bryn Mawr, took place on Thursday, September 17. Miss Thomas is a sister of Miss M. Carey Thomas, President of Bryn Mawr College.

## CHICAGO.

**American Association of Obstetricians and Gynecologists.**—The sixteenth annual meeting of this Association will be held in this city September 22, 23, and 24. Arrangements are being made by the local committee for the entertainment of the Fellows and their guests. The sessions will be held in the law library of the Northwestern University Building, corner Dearborn and Lake streets.

**Incorporation of Pasteur Institute.**—The Chicago Pasteur Institute has been incorporated by A. P. Lagorio, Carlotta Lagorio, and B. G. Bruno, with a capital stock of $2,000 to treat hydrophobia.

**Willard Hospital Buys Land.**—The Francis E. Willard National Temperance Hospital has purchased property at 349 Lincoln street, for $1,500. It is 24x115 feet and is 338 feet north of West Polk street.

**Diphtheria.**—The prevalence of this disease during the week has resulted in seven children being excluded from the W. K. Sullivan School. At least five of them are believed to be suffering from the disease, while the other two are known to have been exposed. All the children excluded from school have lived in dwellings where the disease prevailed. The children were prevented from entering the school through the activity of Superintendent Bodine of the Compulsory Education Department and Dr. Allen with several assistants. The work of the inspectors will continue until all signs of the disease disappear from that vicinity.

**Tour of Inspection by Sanitary Experts.**—Sanitary experts representing the State of Illinois and the Sanitary District will leave Chicago Sept. 16, on a tour of inspection of the Illinois water way via the drainage canal and the Illinois River from Chicago to St. Louis. Their purpose is to prepare the evidence for Illinois to be submitted at the hearing of the sanitary case between the States of Illinois and Missouri, which is to open in this city Sept. 21. Missouri claims that the drainage canal is a menace to the health of the people of Missouri in general and St. Louis in particular, by contaminating the water supply. In the party will be Prof. Long, of Northwest University; Profs. Palmer and Burroughs, of the University of Illinois; Prof. Jordan, of the University of Chicago; Dr. Adolph Gehrmann; W. P. Mason, a noted sanitary engineer of New York; H. L. Russell, of the University of Wisconsin; E. G. Smith, of Beloit College; L. C. Kinnecott, of the

Worcester Polytechnic; Rudolph Hering, head of the Hering Commission, which made the pioneer investigation of Chicago sewage, on which the canal project was founded, and Dr. Reynolds, Commissioner of Health of Chicago. The experts will devote five days to the trip. They will observe conditions of overflow, the backwaters of the various dams along the river, the color of the water at different points, and comparative sanitary conditions below and above Peoria. They will note the improvement of the river from Chicago to Peoria and the effect on the river caused by Peoria sewage, arising from cattlesheds, distilleries, glucose refineries, stockyards, slaughter houses and gas houses and manufacturing establishments.

**Disposal of City Refuse.**—The disposal of garbage has become a very important question in this city. Complaints have been made that in some wards the appropriations for the work of collection of garbage were so small that the work might have to be abandoned. In reference to the system of carting the refuse to open dumps, this has always been reprehensible, and, owing to the growth of the city, should not now be tolerated. It means the maintenance of a most obnoxious nuisance. It is interesting to note that many cities have and are in favor of garbage cremation or reduction plants. We give here the names of some of the cities with the method of treatment employed: Boston, reduction; Buffalo, reduction; New York, reduction; Philadelphia, reduction; Washington, reduction; Louisville, cremation; Cincinnati, reduction; Cleveland, reduction; Detroit, reduction; Milwaukee, cremation; Minneapolis, cremation; St. Louis, reduction; San Francisco, cremation. The list is a rebuke to Chicago, but greater instruction will be found in a municipal year book, which is published in England. This gives us a glimpse of municipalities at work, which shows that we are merely in the kindergarten stage in this country. Speaking of the cleansing department of Manchester, the book says: "For the year ended March, 1902, it dealt with 370,877 tons of refuse, consisting of night soil, street sweepings, market, slaughter-house trading refuse and contents of pail closets. The department is a great manufacturing concern; it makes manure, oil, soap, tallow, mortar; it has two large estates of 3,681 acres, upon which part of the refuse of the city is disposed of, and has workshops where it makes implements, vans, railway trucks, brushes, machines, etc. Nearly 2,000 men are employed by the department, which has over 400 horses and 500 vans and carts. Refuse which cannot be utilized is burned in destructors." When such an elaborate system as this is compared with the crude makeshift to which Chicago resorts, the difference seems almost as great as the difference between a savage and a civilized state of society. The aldermen who are now investigating the subject should realize how far Chicago is behind, and strive at least to make a good beginning.

**Mortality Rate.**—The average August death-rate of the ten years (1893-1902 inclusive) was 16.37 per thousand of population per annum. For August, 1903, the 2,255 deaths reported gave an annual rate of 14.07 per thousand, or 16 per cent. less than the ten-year average, and the lowest August mortality rate on record. The chief reduction is in the deaths under five years and in those from the acute intestinal diseases, from typhoid fever and from whooping cough to which the low temperature and the good sanitary quality of the water contributed. There were 185 fewer deaths from the impure water diseases than in August, 1902. On the other hand, the deaths from diseases especially affecting adult male life all show an increase over last year. The excess of male over female deaths is 27.7 per cent.

**Duty of Injured Persons in Employment of Physicians.**—The Appellate Court of Illinois for the Fourth District holds in C. and E. I. R.R. Co. vs. Burridge, a personal injury case, brought by the latter party, that an instruction stated the law correctly which told the jury that it was the duty of the party suing "to employ such doctor or doctors for the treatment of his injuries as ordinary prudence in his situation at the time of the injury and thereafter required; and to use ordinary judgment and care in so doing, and to select only such doctor as was of at least ordinary skill and care in his profession; but the law does not make him an insurer in such case that the doctor will be guilty of no negligence, error in judgment, or want of care, and where such errors or mistakes occur in the treatment, the injury resulting from such mistakes is properly regarded as part of the immediate and direct damages resulting from the injury."

**Milk for Schools.**—The children in the Chicago public schools will no longer have to drink impure water, if a proposal of the Milk Commission meets with the approval of the Board of Education. Pasteurized milk, on sale at a cent a bottle at every school, is the solution of the problem suggested by the commission. At the Thomas Hoyne school, where the pasteurizing plant is located, the water has been shut off from the building while some repairs have been in progress. More than 300 three-ounce bottles were taken in the course of the day.

## GENERAL.

**Trichinosis in Germany.**—Last week we noted the occurrence of two hundred cases of trichinosis at Homburg. Forty cases are now reported at Neustadt, near Coburg. Some of them have proven of a severe and dangerous type.

**Appointment of Dr. Hutchings.**—The State Commission in Lunacy has appointed Dr. Richard H. Hutchings medical superintendent of the St. Lawrence State Hospital at Ogdensburg, N. Y., in succession to Dr. William Mabon, who recently accepted the post of general superintendent of the New York City hospitals.

**Yellow Fever.**—The State Health Officer of Texas, received telegraphic reports from Dr. I. P. Sessions, whom he sent to Mexico to investigate the yellow fever situation, stating that the disease had appeared at Monterey. According to official statements from the Yucatan Government there were 128 cases of yellow fever in the city of Merida during August of which fifty proved fatal. In Progreso during the same time there were nine cases, but no deaths.

**The Plague at Marseilles.**—A number of buildings on the outskirts of this city, where suspected cases of bubonic plague had been reported, were destroyed by fire to-day. The sanitary officials used sulphur in the disinfection of merchandise in the buildings, and the flames were communicated to the buildings themselves. Only the walls were left standing. The unofficial reports make the situation serious. The dead, it appears, are four women and two men, whose bodies were covered with buboes, leaving little doubt as to the nature of the disease. Eighteen suspects, including four infants, are under surveillance. Three undoubted cases have been admitted to the hospital. The vessel which brought the cargo of rags has been isolated. Other rigid sanitary

measures have been adopted, and it is believed that the authorities desired the removal of the burned buildings as an additional precaution. The local authorities at Genoa have quarantined against Marseilles.

**Enlarge Naval Hospital.**—Surgeon Gen. Rixey has decided to urge on Congress the enlargement of the General Naval Hospital at Portsmouth, Va. The institution now has 200 beds, and he will recommend that it be enlarged so as to accommodate 500. Two modern wings will be erected in rear of the present structure, and a third wing will connect these. There will be isolation wards and every modern convenience. A new steam generating plant and a pest house will form part of the scheme of improvement. Dr. Rixey states that as Portsmouth is to be one of the largest naval stations in America, the facilities for the care of the sick and wounded must of necessity keep pace with the growth of the naval establishment in size and importance.

**Income of the French Physician.**—There are a few physicians in Paris with incomes of $40,000 to $60,000. The average income of French physicians, however, is only $550 a year, or $720 in Paris. Yet, whereas the number of medical men is rapidly decreasing in Germany and Austria, it is still increasing in France. In 1901 there were 2,000 fewer than there are now, though the population was about the same.

**Convenient Device.**—A novel dose-indicator for medicine bottles which has been recently put on the market consists of a disc of cardboard on which is printed the hours of the day in much the same manner as the dial of a timepiece, with the hours divided into quarters. In the upper part of this device there is a loop designed to be fastened around the neck of the bottle and which holds the dial suspended prominently on the side of the bottle. As one dose of medicine is disposed of the exact time of the next one is indicated by moving a clip along to the proper point.

**Cholera in Syria.**—Cholera is reported to be raging fiercely at Birejik, Syria. Birejik is a town of ten thousand inhabitants on the left bank of the Euphrates, at the head of navigation.

**The Prize Essay of the American Medical Association.**—The American Medical Association offers annually a gold medal, value of $100 for the best essay on any subject relating to medicine or surgery. The recipient of this prize will be given the option of the gold medal, or a bronze replica of the medal, and the balance of the appropriation (about $90) in money; or the entire amount ($100) in money. Inasmuch as the Association annually sets apart the sum of $500 for original research, this prize is offered to stimulate the production of a superior practical paper based either upon experimental studies or clinical investigation, or both. The Committee will give preference to papers having the greatest brevity consistent with thorough consideration of the subject, and recommends that the paper shall not exceed 5,000 words. The Committee, while not restricting the choice of subjects, recommends as an important subject for consideration "The Therapeutic Value of the Digestive Ferments." Competing essays must be type-written, and bear no mark revealing their authorship; but instead of the name of the author there must appear on each essay a motto, and accompanying each essay a sealed envelope containing the name of the author and bearing on its outer surface the motto of identification. No envelope will be opened by the Committee until a decision has been reached as to the most deserving essay. The other essays will be returned to their respective authors. The Committee reserves the right to reject all essays, if none are found worthy of the Association medal. Competing essays must be in the hands of the Chairman of the Committee not later than April 1, 1904. Lewis S. McMurtry, Louisville, Ky., Chairman; Burnside Foster, St. Paul, Minn.; M. H. Fussell, Philadelphia, Pa., Committee.

**Cancer Caused Pope's Death.**—Drs. Lapponi and Mazzoni, the physicians of the late Pope Leo, have published a defence against the attacks made upon them by Dr. Cardarelli, who practically charged that they had made a wrong diagnosis of the Pope's disease, and declared that he died of pulmonary cancer instead of pleurisy or pleuro-pneumonia. Both physicians say that they detected the true nature of the Pope's illness, but Cardinal Rampolla, the Papal Secretary of State, objected to having it made public. When the symptoms became clearer they insisted upon being allowed to protect their reputations against easily foreseen criticism, but Cardinal Rampolla was immovable. He even refused to have it announced that a third operation of thoracentesis had been performed, although Drs. Lapponi and Mazzoni did perform such an operation. The physicians, therefore, wrote in the presence of a witness a full history of the case, giving the real nature of the disease. Copies of the statement were given to Cardinal Rampolla and the major domo of the Vatican.

**Fighting to Keep Out Smallpox.**—The State Health Department is urging extraordinary precautions against a smallpox epidemic in the town of Hoosick and the village of Hoosick Falls. There are more than a dozen cases at Bennington, Vt., which is connected by trolley line with the Hoosick neighborhood. No cases have yet crossed the State line, and it is hoped that general vaccination will prevent spreading the disease.

## CORRESPONDENCE.

### AN IMPOSTER.

*To the Editor of* MEDICAL NEWS:

DEAR SIR: Permit me through the medium of your valuable journal to warn the profession concerning a young man who pretends to be my nephew, and on various pretexts secures money, mostly, I regret to say, from my personal friends. I have no nephew by the name of Musser, and know of no one who dare use my name in any scheme whatsoever.

I should add, Mr. P. Corzelius, representing the American Medical Association, has a letter from me, as well as other means of identity, for the purpose of carrying on his work. Yours very truly,

J. H. MUSSER.

1927 Chestnut St., Philadelphia, Sept. 11, 1903.

### THE HISTORY OF THE DISTRIBUTION OF STERILIZED MILK TO TENEMENT HOUSE CHILDREN IN NEW YORK.

*To the Editor of the* MEDICAL NEWS:

DEAR SIR: In an article on the subject of infant mortality, by Dr. Rowland G. Freeman, in the MEDICAL NEWS of September 5, 1903, the following statement occurs, speaking of the distribution of milk, or as the

author says, a "suitable nutriment to the bottle-fed babies of the tenements;" by this we must all understand pasteurized or sterilized milk.

"New York City owes to Nathan Straus a great debt of gratitude for *inaugurating* or *carrying out*, at his own expense, this most valuable aid to its tenement house babies."

The facts in connection with the inauguration and distribution of good and fit milk to the children of the poor, are as follows:

The main idea of distributing milk, suitable for infant feeding, among the poor of the tenement districts of New York, originated with the author of this communication. After having been in charge of the children's class of the Good Samaritan Dispensary, then the Eastern, for some time, and noticing from year to year the futile attempts to treat the gastro-intestinal disturbances of infancy and childhood during the summer months, without the aid of a suitable nutriment, I began to agitate the placing within the reach of the sick poor children of a nutriment which was not only suitable (modified), but which could not easily be rendered unfit for the infant, as regards acidity and bacterial content. I began the distribution of bottles of sterilized milk to sick infants in May, 1890. At this time the scheme was rather discouraged, because as one physician, a chairman of one of our societies, said, the washing of the bottles would be the chief obstacle. Undaunted, however, I constructed apparatus, and after much labor, opened my laboratory, such as it was, in the summer of 1890. I presented the apparatus before the County Medical Society in May, 1890, and before the Pediatric Section of the Academy, in November of the same year, I read a paper embodying my experiences. That summer I had only supplied 134 infants with 7,000 bottles of sterilized modified milk, but it was a beginning. Mrs. Felix Adler, through her physician, Dr. Richard Stein, heard of my efforts to reach the poor children, and seeing I was handicapped by lack of funds, she organized a committee of ladies, the first of its kind, to establish a large plant which would furnish sterilized milk to tenement house babies. This improved laboratory was opened in 1891, and from June 15 to October 15, 1891, 575 children were fed with 40,000 bottles of sterilized milk. I then began to try to reduce the temperature of sterilization, and found 85° C., or 185° F., consistent with safety, instead of 100° C., or 212° F. My results were again published in the *New York Medical Journal*, October 15, 1891. In the year 1892 to 1893, we supplied 1268 children with 97,000 bottles of this milk, sterilized at this low temperature. Two years before this we had established two sub-stations for sterilized milk, one at Jungmann's pharmacy, Sixtieth street, and another in Harlem. Our funds gave out in the subsequent year, and we devoted our energies to our own dispensary plant, where the demand was most pressing. About this time, 1893, Mr. Straus sent his representative, Mr. Kinkead, to my laboratory, saw our work, and I also gave him a note to Dr. T. M. Rotch, of Boston, who had at that time established the Walker-Gordon Laboratory. Mr. Straus received and adopted many suggestions as to the washing and sterilizing of bottles, also corking, which he adopted in his first plant, and which he was then about to open. His representative saw me several times, and also listened to my papers read before the Academy. To be concise:

In 1894 we distributed about 150,000 bottles, whereas all the Straus depots distributed 300,000.

In the year 1899, the ninth to tenth year of our existence, I was feeding a daily average of 200 children and giving away 379,776 bottles of milk a year, sometimes pasteurized, others sterilized, according to the weather. This is more than half the number distributed by Mr. Straus' many depots in the same year. Today the laboratory I first established is feeding on an average of 200 babies of the tenements daily with milk, either sterilized or pasteurized, according to the exigencies of the weather, and the directions of the physicians. I may say that, from the very start, my idea was only to give the milk on a prescription from a physician, which has always been done. This is the only orderly way of distributing milk for infant feeding.

I have in the above given a succinct history of the inception, the inauguration and the success of the main idea of giving the poor sick children of New York the milk, their life food, in a form in accordance with scientific advances of infant feeding. In doing this I am actuated by the same motives I was in the inception of the affair. The credit of this method of feeding the poor belongs to the writer of this communication, who, at the sacrifice of labor which cannot be estimated, and his own means, carried it to completion. Let no one think that I do not appreciate the wise and philanthropic efforts of one of our most respected lay citizens; far from it, and glory to him; but to the medical profession and to us here in New York, belongs the credit of the whole idea and its successful operation to-day. More especially should the profession take unto itself the credit of this idea, inasmuch as, in the year in which the decline of mortality is shown by Dr. Freeman, to be decided, the Good Samaritan Dispensary laboratory, under my guidance, was contributing to the infants of a most densely crowded tenement district, more than half as many bottles of sterilized milk as the whole aggregate of the Straus depots (600,000).

692 Madison Ave.,
New York, Sept. 8, 1903.

Henry Koplik, M.D.

## TRANSACTIONS OF FOREIGN SOCIETIES.

### German.

**Tendoplasty.**—The German Society for Orthopedic Surgery, Second Congress, held in Berlin, June 2, 1903, was opened by Vulpius, who presented a paper on tendoplasty, based upon his own extensive experience with 400 cases. Most methods employed for elongating tendons are followed by good results. The newly formed tissue is fibrous and later becomes tendinous if hemorrhage and infection do not occur. Tendons are best shortened by means of partial excision or suture. An atrophic muscle may thus regain its function by overdistention and loose joints can be rendered firm. Tendon transplantation is a more difficult operation; the speaker's own method or the periosteal or transosteal modifications all give good results. Silk tendons to fill in gaps are recommended only where no other method is possible. Peripheral paralyses are most amenable to treatment, but in poliomyelitis, Little's disease and apoplectic hemiplegia much improvement is often seen. Arthogenous contracture of the knee-joint, congenital clubfoot and flatfoot will often yield to transplantation. Defects in tendons may be treated by using a neighboring tendon or by implanting human or animal tendons or pieces of silk or catgut.

F. Lange prefers total transplantation in the leg, since the function will be more perfect than where only part of an adjoining tendon is used. He uses his method where more than three muscles are paralytic and discusses new points of insertion to restore the most perfect functions. Where periosteal transplantation is indicated, the sutures are also passed through the ligaments and cartilage, to give the tendon a better hold. Silk is to be preferred here, and abscesses are avoided

by draining for forty-eight hours. Three silk tendons were demonstrated, which had functionated for two and three years and which were surrounded and permeated by tendinous tissue.

In the discussion which followed SCHANZ recommended aluminium-bronze as suture material. WITTEK has attempted to transplant the ileopsoas so that it will act as extensor. VULPIUS also praises total transplantation, but states that this method cannot always be resorted to.

**Treatment of Fractures.**—A paper on the treatment of fractures implicating joints by means of extension and orthopedic procedures was read by BARDENHEUER.

**Spondylitic Curvature of the Spine.**—FINK treats spondylitic curvature of the spine by horizontal position in plaster of Paris, aided by strips of cotton applied crosswise under the deformity. After about a year the patients begin to wear a corset.

**Coxa Vara.**—The etiology and forms of congenital and acquired coxa vara were discussed by JOACHIMSTHAL. BORCHARDT looks upon a traumatic separation of the epiphysis as real cause, while FROHLICH detected the *Staphylococcus albus* in the bone-marrow of two cases, and ascribes the deformity to early, chronic osteomyelitis. Good results are obtained according to CODIVILLA from osteotomy in the neighborhood of the trochanter with fixation of the shaft in abduction.

The final papers were read by BADE, who improved the corset for scoliosis by a rubber bag on its inner side, which can be inflated, and by SPITZY, whose clinical and anatomical investigations show that the newly born never possess flat feet.

## SOCIETY PROCEEDINGS.

### BRITISH MEDICAL ASSOCIATION.

*Seventy-first Annual Meeting, Held in Swansea, July 28, 29, 30 and 31, 1903.*

(Continued from Page 528.)

**The Methods at Present in Vogue for the Reduction of the Dislocation.**—"I shall confine myself to the measures at present employed, and I shall also deal only with those that aim at the reduction of the dislocation, without wasting time on the question of apparatus and orthopedic appliances. It may fairly be said at the present time that all cases of a suitable age should be submitted to some form of operative treatment, and that those who are over that age will probably get on better without apparatus than with it; there seems to be no really satisfactory apparatus in use, nor, indeed, does it seem likely that such a thing could be designed. In discussing the question of the methods employed for the reduction of the dislocation, the foremost place, at any rate on the ground of priority, belongs to the operative procedure commonly known as the 'Hoffa-Lorenz' method, which is still practised by so well-known an authority as Professor Hoffa, or at all events was advocated by him so recently as the Thirteenth International Medical Congress held at Paris in 1900.

**The Hoffa-Lorenz Operation.**—"The steps of the operation are briefly as follows: The patient is anesthetized, and full extension is made until the trochanter is nearly on a level with Nélaton's line. While full extension is maintained, an incision is made parallel with the anterior margin of the great trochanter, and one-quarter of an inch in front of it and commencing at its upper angle.

"The fascia lata is fully opened up, the gluteus medius and minimus are retracted, and the capsule of the hip-joint is opened by an incision made upon the neck of the bone while the assistant, who still keeps up extension, abducts and rotates out the limb in order to facilitate this. The capsule is slit up right to its insertion into the rim of the acetabulum, and, if this does not allow the head of the bone to come well up into the wound, the incision in the capsule is made T-shaped by a second incision parallel to the anterior intertrochanteric line. The finger is then introduced into the acetabulum, which is deepened with a gouge or a sharp spoon. Hoffa lays stress on the new acetabulum being made circular, with deep and overhanging edges, especially above. This new acetabulum is fashioned, partly by deepening the old one and partly by gouging away bone from its upper and outer rim. The head is now replaced in the acetabulum, chiefly by traction, and if necessary is trimmed until it fits it. The wound is left open, and is packed with gauze. Outside this a plaster-of-Paris spica is applied, while the assistant maintains the extension and also keeps the limb in a position of abduction and slight inward rotation. The child is finally placed in a Phelp's box. The limb is kept in plaster for three or four weeks, at the end of which the child has electrical treatment and gymnastic exercises daily, with special attention to the abduction movements.

"There are several objections to this method, any of which are sufficient to put it out of court as a routine treatment for congenital dislocation. Indeed, Hoffa himself realizes this, and only advocates the operation for cases in which Lorenz's 'bloodless method' has failed, or for children beyond the age at which the latter method is likely to be successful. The great objection is the risk of anchylosis which is likely to follow the extensive interference with the joint surfaces; this risk is still further increased by Hoffa's plan of leaving the wound open and stuffing it with gauze. This latter procedure, which Hoffa advocates in order to minimize the risk of sepsis, I believe to be quite unnecessary, but even without it the risk of anchylosis is necessarily great. Whenever both articular surfaces are denuded of their cartilaginous covering, especially in a young child, anchylosis, generally of a severe type, is almost certain to follow even in spite of vigorous passive movement.

**Burghard's Method.**—"In order to overcome the difficulties presented by this operation, and at the same time to ensure the true reduction of the dislocation, I have been in the habit for some years past of practising an operation that combines to some extent the more important features of the 'bloodless method' with the certainty of the open operation. The real merit of Lorenz's so-called 'bloodless method' is not that it is bloodless—for that is its weak point—but that it calls attention to two facts that must receive adequate treatment if success is to be obtained. The first fact is that the chief obstacle to reduction, as far as the muscles are concerned, lies in the shortening of the adductors, and the second is that after reduction the only stable position for the limb in the majority of cases is one of extreme abduction. These two important points I utilize in the following operation.

"At a preliminary sitting, under full anesthesia, the adductors are either fully stretched or are divided with a tenotome; the procedure in fact is so far similar to the 'bloodless method' which will be described immediately. If reduction is effected by these means well and good; the limb is then put up as in Lorenz's method, and the results are checked by skiagraphy. Should reduction by these means fail, or should reluxation occur, the hip-joint is exposed at a second sitting, a week later, by an incision from just below the anterior superior iliac spine in the interval between the sartorius and the tensor fasciæ femoris, and the capsule is exposed as for excision and slit up fully, the head of the bone pro-

truded, and the finger introduced into the acetabulum; the ligamentum teres, if present, is cut away. The head of the bone is now guided into the acetabulum by the finger already introduced into it by manipulations closely resembling those in the 'bloodless method,' and when this is accomplished it will generally be found that the limb spontaneously assumes a position of marked abduction and of outward rotation, although the latter position is not at all constant; indeed, where the angle of femoral torsion is very great there will be rotation inward. As a rule I divide the tendon of the iliopsoas obliquely with a pair of blunt-pointed scissors introduced into the wound, as I have found it a powerful agent in inducing reluxation.

"The exact method of incising the capsule is not of much importance: latterly I have made it parallel to the long axis of the neck of the femur and over the head of the bone made prominent by rotating the limb outwards. This has the advantage that the incision is in the lax portion of the capsule and allows the thickened anterior portion lying over the acetabulum to be more easily defined. It is this latter portion of the capsule that offers the greatest obstacle to reduction; the finger passed through the narrow slit-like opening between it and the upper edge of the acetabulum will ascertain whether there is room for the head to pass into position, and if not, a way must be made for it by detaching the capsule from the acetabular rim sufficiently to allow of its passage. It is always well, however, not to detach the capsule too freely from the rim of the acetabulum as the various bands in that situation are powerful agents in preventing the head of the bone from slipping out of place. No attempt whatever is made to deepen the acetabulum or to shape the head of the bone afresh. There has been no difficulty in getting the head of the bone into the acetabulum in any of the cases operated upon by this method; its exact position is determined by the finger in the wound, and there can be no mistake. In order to maintain the head of the bone in position—which is really the hard part of the procedure—a portion of the lax capsule above the acetabulum is excised by an elliptical incision and the cut edges are brought together with stout catgut sutures. The capacity of the capsule is thus diminished and the joint is rendered more stable. The deeper tissues are finally approximated with catgut sutures and the skin wound is closed without drainage. The operation can be done through an incision about 3 inches in length, and there is practically no bleeding; if more room be required it is easy to curve the incision outward above and to detach part of the origin of the tensor fasciæ femoris from the iliac bone.

"All that now remains to be done is to put up the limb in a suitable immobilization apparatus. At first I employed a modification of Croft's plaster-of-Paris splint, so designed that the wound could be inspected at any time without disturbing the parts, but more recently I have simply put up the limb in a plaster spica, taking in the knee. The Croft's splint was used to avoid the risk of suppuration beneath a fixed plaster bandage; but, as such a thing has never occurred in any of my cases, the ordinary plaster spica is now applied from the first, and allowed to remain undisturbed for three weeks, when it is removed with a Gigli's saw under anesthesia, the stitches taken out, and a fresh spica applied. An X-ray photograph is taken at the same time, and, should the head of the bone be found to have slipped out of place, the wound is opened up and reduction again effected. The position in which the limb is put up in the first instance depends entirely upon the position of maximum stability. In all cases there is one position in which the limb remains without reluxation occurring, and this is the position chosen. It is nearly always the fully abducted position, generally with some outward rotation but often with inward rotation. I have had cases in which the only stable position was that of full extension and rotation inward. The after-treatment corresponds almost exactly to that for the 'bloodless method' except that it takes rather a shorter time. The results will be discussed in connection with those of the latter method.

**Lorenz's "Bloodless Method."**—"The patient is fully anesthetized and the adductor muscles are first fully stretched or torn through subcutaneously by striking them repeatedly with the ulnar border of the hand while the limb is forcibly abducted. At first the abduction obtained is limited, but as the rupture of the muscles goes on it increases until the limb is abducted through 90 degrees. During this the assistant steadies the pelvis, pressing down the sound side of the pelvis. Should there be much shortening, horizontal traction upon the limb may be made to bring the trochanter down to the level of Nélaton's line, but this is rarely necessary.

"When the parts have thus been fully stretched, reduction of the dislocation is effected by vertical extension, that is, traction upon the limb flexed at right angles to the pelvis. At the same time direct pressure is made over the great trochanter, and, as the extension is reaching its full limit, the limb is carried outwards, that is, abducted through a right angle. By these maneuvers the head of the bone is made to pass forward over the posterior lip of the acetabulum—an event marked by a loud and characteristic click—until it lies over the acetabular depression. In order to fix the head here the limb is put up in a position of abduction, carried if necessary as far as 90 degrees, and at the same time hyperextended and rotated slightly inward. In this position it is kept for four or five months by a plaster spica that does not take in the knee; at the end of this time a second spica is applied after the limb has been brought into a position of moderate abduction combined with a slight degree of flexion and this is kept on for another four or five months, during which time the child is encouraged to walk as much as possible, so that the pressure of the head of the bone against the acetabulum may deepen and develop the latter.

**Discussion of the Value of the Foregoing Methods.**—"This difficult subject has been aided somewhat by the X-rays. It is now easy to be exact in speaking of the results of treatment, and it is no longer possible to speak of a case as 'cured' when a radiograph shows that the head of the bone is out of place. To this latter category must undoubtedly be relegated a large number of the 'cures' of past years. In future no case can be considered 'cured' unless a radiograph shows the head of the bone in a normal acetabulum, which itself has undergone development and is practically indistinguishable in shape and size and position from its fellow. I could show several cases in which the gait is practically perfect and which most observers would pass as true cures, but in which a radiograph shows the head of the bone above and behind the acetabulum. In speaking of cures among my own cases I mean true cures in the anatomical sense of the term.

"For convenience, the results obtained by any of the foregoing methods of reduction may be divided into three groups: the first is the true anatomical cure in which the affected joint is indistinguishable from the sound one; the second is the group of 'improvements' in which the joint, though not anatomically correct, is nevertheless stable; the gait is markedly improved, and the lordosis is absent, although shortening persists.

Here the head of the bone usually makes for itself a new acetabulum, partly out of the old one and partly out of the ilium above and behind it. Finally, there is the group of failures in which the head of the bone resumes its position on the dorsum ilii, where it slips about as before. By some writers these three groups have been classified as (1) reposition; (2) transposition; and (3) recurrence.

"Great divergence of opinion exists among writers as to the proportion of cases to be allotted to the first two of these groups. There should be no possibility of doubt as to the question of a true radical cure now that radiography is so universally applicable. A glance at a radiographic print will show the difference between a true and a partial cure. When the cure is a true anatomical one the head of the bone lies in the center of the acetabulum; however small or ill-developed the cavity may be, the clear space denoting the Y-cartilage in the acetabulum can always be seen, and the center of the globular head should be directly opposite that. The Y-cartilage is the most reliable landmark in determining whether the head of the bone is in its normal position; the others may be fallacious, owing to the position in which the limb is put up. Should the center of the head lie above the Y-cartilage it is certain that the head, although possibly lying to some extent in the acetabulum, nevertheless does not do so entirely, and that the new joint surface is formed partly at the expense of the old one and partly from the outer surface of the ilium.

It will be obvious from what has gone before that there are fewer difficulties in the way of a true reduction of the dislocation if the attempt be made after opening the joint than if it be made by the 'bloodless method,' and that therefore in order to prove their case the advocates of the latter must be able to point either to better results or to diminished risk. The first and most serious difficulty peculiar to the bloodless method is the covering-in of the acetabulum by the anterior part of the capsule or 'the capsular hymen' that has already been referred to more than once. If the slit-like opening into the acetabulum be too small for the head of the femur to pass through—as in my experience it often is—it is absolutely impossible to obtain true reduction by any mere manipulations: nothing short of an open operation will do. And the chances of the surgeon being confronted with this difficulty must increase with the age of the child, for, as we have seen, the obliteration of the acetabular cavity by the thickened anterior part of the capsule tends to increase as the patient's age advances, so that, even if reduction could be effected at an early age, it may be mechanically impossible by manipulation later on in life. From this it follows that, if Lorenz's method is to be adopted, it should always be done as early as possible after the child has become sufficiently clean to allow the necessary plaster bandages to be worn.

"Another drawback that must have struck those who have had much practice with the 'bloodless method' is the difficulty of being sure when the head of the bone is in the acetabulum. This point does not seem to have attracted the attention it deserves, for the difficulty is a very real one, even in experienced hands. It is true that the head of the bone gives a loud click as it passes over the posterior rim of the cavity, but it is easy, as I have repeatedly proved when performing the open operation, to obtain both the loud characteristic click and the stable limb without the head of the bone being in the acetabulum at all; what happens, at any rate in some cases, is that the head rides forward over the posterior acetabular rim, and then jumps to a position above and behind the joint where it is held in an apparently stable position by the extreme abduction that is being practised at the same time. In other cases there is already a shallow ridge of bone thrown out to bound the new acetabulum, and it is this that the head of the femur jumps, and it is into the newly-formed false joint that the head is reduced, being held in a stable position by jamming it against the ilium by the extreme abduction. This also I have actually verified more than once upon the operating table.

"Hallopeau presented to the Anatomical Society of Paris the dissection of the left hip of a child 2½ years old, who died of bronchopneumonia thirteen days after an attempt to reduce a congenital dislocation by the 'bloodless method,' and he sums up his observations by saying 'It would therefore have been quite useless to expect a bony point of support from the bloodless reduction of this dislocation.'

"It is common experience that great improvement follows the open or the bloodless method in the majority of cases provided that the patient is of a suitable age. The question of the durability of the improvement, however, or, in other words whether a false joint formed as a result of the operation is permanently stable or not, is one upon which little reliable information is at present forthcoming. The reason for this is that in the first place the operation—bloodless or open—has hardly been practised long enough to allow of its ultimate results being accurately gauged, and, moreover, attention is chiefly devoted to the 'cures,' while, in the second place, patients are very apt to pass from the surgeon's notice after a time; it is hardly likely that they would keep themselves under observation from early childhood to adult life, as is necessary if the true permanence of the 'improvement' is to be tested. It is a point to which particular attention must be directed in the future.

"And now, having pointed out the anatomical difficulties that lie in the path of true success with the 'bloodless method,' let me turn to the 'cures' claimed for it by those who practise it. Here we meet with a most extraordinary discrepancy in results and some considerable vagueness in language. Thus, Lorenz says that half of his cases are unsatisfactory from the anatomical point of view, and are to a certain extent failures. This he attributes chiefly to alterations in the neck of the femur, rendering it impossible to get the head of the bone in place without putting the limb in a position incompatible with ability to walk. He says, however, that even these cases are much improved by the new and stable joint. As to the anatomical cures, he remarks: 'In many cases the acetabular cavity enlarges and deepens concentrically, so that we can look upon it as a true anatomical restoration of the joint. In the majority, however, the acetabulum enlarges eccentrically by a new formation of bone along its upper border, beneath which the head of the bone remains firmly applied.' These latter cases clearly fall into the second group outlined above, and of course cannot be looked upon as true anatomical cures.

"As to the question of the relative safety of the various methods. It is true that Hoffa, in giving the results of his experience of the Hoffa-Lorenz operative method, says that he had 7 deaths in 248 cases directly traceable to the operation. These, however, were all from faulty asepsis in the earlier cases, and in the last 132 cases there has been no death. Indeed, the question of risk from the open operation that I have described above may be dismissed as trivial. The operation is easy; there is no shock even in the youngest subjects; the operation is practically bloodless, and occupies only a short time. On the other hand the list of accidents that may be laid to the credit of the 'blood-

less method' is a large one, although no fatality has occurred in connection with it as far as I know. Thus there may be severe shock; the femur may be fractured at either end or in the shaft; a very large hematoma may require incision and drainage; edema of the limb may occur, or severe lymphangitis; the sciatic nerve has been known to have been permanently paralyzed. Thus the 'bloodless method' is by no means free from risks, even in very skilled hands, and I venture therefore to suggest that at any rate it should not be advocated to the exclusion of other and more precise methods.

"My own practice is to make a careful trial of Lorenz's method, in the first instance, in all cases under five years of age, and to check the results by radiography. If this does not show a true anatomical cure, I proceed to open the joint and deal with the dislocation in the manner already described; and so convinced am I of the freedom from danger that I do not hesitate to reopen the wound and reduce the dislocation afresh should it be found during the course of treatment that the head of the bone has escaped from the acetabulum; I have done this on two occasions with perfectly satisfactory results. Occasionally I try the Lorenz manipulations a second time if the patient be quite young—say under three years of age—and if the joint be quite mobile and with little shortening, as these cases are most suited for Lorenz's method. When, however, the child is near five years of age, and one careful attempt has failed, I do not waste time further, but open the joint at once. When the child is over five the chances of success by manipulation are much less, and I rarely spend much time over it. The manipulations are used here more as a preliminary to operative interference, and I would advise that, unless the head of the bone clearly goes into the acetabulum during them, time should not be consumed in an attempt that is almost certain to be futile, but that the open operation should be performed in a week's time.

"Bilateral cases are admittedly difficult to treat by manipulation. I believe that much time will be saved and much more good will be done by performing an open operation upon both sides at an interval of, say, three months.

"My own results I may summarize as follows: Lorenz's 'bloodless method' I have tried in 30 cases; in only one of them was a perfect cure obtained, and this case was a child under three years of age. In the remaining 29 some were submitted later to an operation, but all of those who for any reason were not, were very much improved as to gait and general usefulness, two or three of them being so much improved that they would, in the absence of radiography, have easily passed for cured. The only accident that has occurred to me in performing this method was a partial separation—or rather, a mere loosening, for the radiograph showed no separation—of the lower epiphysis of the femur in one case. This did not interfere at all with the progress of the treatment. I have performed the open operation that I have already described in 13 cases. In 9 the cure has been perfect, and the children are now walking about quite well; in 3 the head of the bone has escaped and has formed a new acetabulum above and behind the old, but the joints are quite stable—in other words, these are transpositions; 1 case is still under treatment; and in no case has there been complete failure. I do not therefore recommend the open operation as an infallible cure for these cases; but as a method that is safe and at the same time more likely to produce a precise result than mere manipulations. At the worst, if it fails to cure, it gives a result as good as the latter.

"The following conclusions are drawn from the foregoing considerations: (1) That all cases should be checked by radiography, and that no 'cure' should be spoken of that is not a true anatomical cure. (2) That all cases of congenital dislocation under fourteen years of age should be submitted to treatment. In the great majority improvement will result, while in some a true anatomical cure is brought about. (3) That in all these cases Lorenz's manipulations should be tried in the first instance. Even should they fail to effect reduction they facilitate any subsequent procedures. (4) That the prospect of a cure by Lorenz's 'bloodless method' is in direct proportion to the youth of the child, and that after the age of four years there is little hope of a true cure by its means. (5) That in any case the chances of a true cure by the 'bloodless method' are not very great. (6) That an open operation should be done whenever a radiograph shows that the 'bloodless method' has failed to reduce the dislocation, except perhaps in the case of a very young child—under three years—in whom the manipulations may be repeated. (7) That with the open operation no fear need be entertained of shock, bleeding, or sepsis. (8) That under no circumstances should the joint surfaces be remodeled. (9) That an open operation is more calculated to result in a cure as it enables the surgeon to ascertain beyond a doubt when the head of the bone is really in the acetabulum. (10) That the open operation is especially suited for cases over four years of age and for those of bilateral dislocation. (11) That after the operation the limb should be put up in the position of maximum stability; in the majority of cases this will be similar to Lorenz's position. The limb should be put up in plaster-of-Paris immediately and the casing should take in the flexed knee; this is essential in order to ensure stability of the head of the bone. (12) That all tense structures should be stretched or tenotomized as a preliminary measure a week or so previously to the open operation. The after-treatment is practically identical with that of the Lorenz method."

Mr. Noble Smith showed radiographs of 4 cases, one double in a girl aged six years, one single in a girl aged 11½ years, one single in a girl aged twelve years, and another single in a young lady aged 17½ years. These cases had been operated upon by Lorenz's method since he had seen Professor Lorenz operate in this country. In all these cases a fairly good result had up to this time been attained, although we had still to wait to see what the ultimate results would be. As regards the comparative value of the two forms of operation, he (Mr. Noble Smith) held an open mind, and so long as he could obtain good results, as in the cases shown, he would be content to depend upon operation without opening the joint. In this respect he was in accord with Mr. Burghard. He felt personally much indebted to Dr. Lorenz, because since seeing him operate he found he had succeeded far more satisfactorily than he had done when depending upon Lorenz's written description. He had operated on other cases but these four were the only ones in which he had obtained radiographs of the conditions before and after operation. He had said that the results were fairly satisfactory, but he must add the words considering the ages of the patients. In the six-year-old child the period of six months had elapsed, and he had removed the splint, and had found the joints working quite well, but still held in a very flexed and abducted position; this partial fixation was doubtless beneficial as regards the ultimate perfection of the joints. In the child aged 11½ years the position was very good, but it appeared from the radiograph that the head of the femur had

become detached; he did not think that this would prevent a good result. In the twelve-year-old child a perfect position appeared to have been attained. In the girl of 17½ years he had preceded the operation by many months of stretching and extending the joint. He had succeeded even in this case in placing the head of the femur in a natural position, but there had been a great tendency for the head to slip backward, and the radiograph showed that the head was behind the acetabulum, but at the same time there was no tendency for that head of bone to pass upward. He thought he had succeeded since then in replacing the head perfectly. Mr. Noble Smith also referred to another case of double displacement in a six-year-old girl, in whom he had no difficulty in reducing one joint, but on the other side he had not been able to obtain a perfect result, because the head of the femur could not be placed sufficiently forward. However, he thought that practically even under such circumstances a good result might be anticipated.

Mr. R. C. Dun said: "My experience of Lorenz's bloodless method has been limited to 4 cases. The first of these was reduced, some two months before Professor Lorenz's visit to this country, and the position obtained was not completely satisfactory. I learned much in watching Lorenz himself, and studying his methods of manipulation and subsequent fixation—particularly did I learn the importance of thorough stretching of the anterior part of the capsule of the joint after the reposition of the head. It is, of course, too early to say what the ultimate result in these cases may be. Undoubtedly improvement is generally evident when the child first begins to walk; it has yet to be proved whether such improvement is permanent. I have found that the employment of thin aluminium strips, incorporated with the plaster casing, materially diminishes its weight, and enables the patient to get about more readily."

Mr. Robert Jones said: "I believe that more than one way exists for the cure of congenital hip, and that the same method will not suit all. More good will come from a study of the causes of failure than from the most carefully compiled statistics. For years we have tried methods which have yielded an occasional success, such as extension and abduction in abduction frame, osteotomy of the neck to correct antiversion, manipulations for reductions, and various forms of operation procedure. Neither the Hoffa nor the Lorenz modification appeals to me, as stripping a joint of its cartilage and whittling the head of the femur directly makes for an anchylosing arthrodesis. The essential difference between the methods of Paci and Lorenz is in the recognition by Lorenz of the rudimentary character of the acetabulum and the necessity of enlarging it by direct pressure of bone. In support of the probability of this occurring I may mention that in a boy aged seventeen years, in whom I exsected the head of the femur for a traumatic dislocation, I found an excellent attempt at the formation of a joint. Until the visit of Lorenz I had no idea of the thoroughness of his manipulations, and I at once saw why so many failures had occurred in this country. Since his visit I have operated on 38 cases, 34 of which were reduced, as confirmed by palpation and X-ray photographs. In 4 cases the neck of the femur was fractured, and the shafts transposed anteriorly. These were only complications, and with an increase of experience I think they should not occur. The causes of failure in reduction were folds of capsule between the acetabulum and femoral head, sometimes constriction of the capsule, the importance of which was overrated, anteversion of the neck, and instability of the articulation, due either to a faulty head or rudimentary acetabulum. Of immense clinical importance is the question, 'Can these defects be recognized clinically?' In reply, I think that on completion of reduction one can prognose whether it will be permanent or not. If the hip in the act of being reduced gives the sensation experienced in the reduction of a traumatic case, and if there is stability after reduction, the prospects are good, and the prospects are moderate in those cases where reduction becomes stable after stretching the anterior portion of the capsule by prolonged extension of the abducted hip. Failure may safely be prognosed when the femur slips out of joint on the slightest provocation. In this last variety, exploratory incision is called for to correct soft structure obstruction, or to correct anteversion of the femoral neck. Anteversion can be diagnosed by radiography, as well as by palpation. If operation is done I strongly advocate incision after the dislocation is reduced, and if anteversion exists, the performance of osteotomy of the shaft of the femur, the neck being held in position by pins as recommended by Schede and Bradford. The statistics of the open and bloodless methods are in the hands of the two greatest authorities, Lorenz and Hoffa, about 50 per cent. of cures. This is sufficient proof that there is considerable overlapping, and that the majority of cases operated upon by Hoffa would be simply manipulated by Lorenz. I agree with Mr. Burghard that it is best not to denude the cartilage, but in the worst cases, where operation is most called for on account of anatomical misfits, how is the head to be retained short of excavation? In view of the diverse opinions, I intend to persevere with the Lorenz method as a routine, operating only in the exceptional case, and after a sufficient lapse of time shall form my own conclusions with regard to final results."

Mr. A. H. Tubby said: "With reference to the method of forcible reduction, according to Lorenz's method, we have not at present any means by which we can be quite sure that when the head of the femur appears to have been reduced into its proper place there is no infolding of the capsule or interposition of the capsule between the bones owing to the action of the tense iliopsoas. In fact it seems to me that the data on which an estimation of the condition of the parts may be made, both before and after reduction, are somewhat vague. Neither tactile examination nor the use of the X-rays can be relied upon to tell us exactly what the true state of affairs is. I have not had the opportunity of seeing Lorenz operate, but I am far from being satisfied that an entirely successful method of treatment has been found, even for young children. The risks are not inconsiderable. Fractures of the thigh, tearing of the sciatic nerve, rupture of the femoral artery, and gangrene and death have occurred. In fact it seems to me that the risks of this forcible procedure are as great if not greater than those appertaining to the open method, which may be summed up by the word 'sepsis.' Doubtless while each case should be treated on its merits, it is well, as far as possible, for every surgeon to adopt a line of treatment which promises to him the best results. I have been successful, so far as the certain reduction of the dislocation is concerned in recent cases, by first exsecting a portion of the adductor muscles, and of the sartorius and tensor vaginæ femoris, and then placing the limb or limbs in full abduction and extension for six weeks. Then the joint was opened by the anterior method and the resistant parts of the capsule divided, and by manipulation the head was reduced. The incision in the capsule was closed by suture, and the edges of the skin wound brought together and the limb placed in full abduction and retained there in plaster-of-Paris. I intend to treat

a number of suitable cases in this way, and shall be happy to report on them in three years' time. Indeed, I feel that such a course is imperative in the present condition of treatment of congenital displacement of the hip."

Mr. Burghard, in closing, thanked the speakers for giving their valuable personal experience. He regretted that the subject had been brought up so soon after the visit of Professor Lorenz had attracted special attention to the matter, so that sufficient time had scarcely elapsed for much reliable information to have been gained. He trusted that in a few years' time there would be another opportunity of contrasting the later results of the various methods of treatment. What was wanted for the true elucidation of this very difficult question was not an advocacy of one method to the exclusion of all others, but a series of cases by careful observers who were not concerned to advocate the method, but to state the facts. The question as to the permanence of the results must be the point to which attention should be directed most particularly in the immediate future. He still held strongly to the view that no one method was likely to succeed in all cases.

**Splenomegaly in Infants and Young Children.**—Dr. George Carpenter said that enlargement of the spleen is not an uncommon manifestation in early childhood, and it is frequently found enlarged in infancy. The clinical material which has passed through his hands during the last few years at the Evelina and the North-Eastern Hospitals for Children comprises 348 cases in whom the spleen was enlarged, as determined by palpation, from all causes during the first twelve years of life, cases such as are commonly found in out-patient hospital practice, and which have not been selected.

Dr. Edmund Cautley asked what Dr. Carpenter meant by splenomegaly. Did he include all cases in which the spleen could be felt? It certainly seemed so, judging by the fact that such a large number of cases had come under Dr. Carpenter's notice, and that no less than 163 were infants under one year of age, and as many as 320 out of the total of 348 were infants under eighteen months of age. Dr. Cautley suggested that the spleen was so easily felt in infants under six months on account of anatomical peculiarities, and in infants from six to eighteen months on account of rachitic deformity, that it might readily be supposed to be enlarged. He noted, also, that of the 57 cases associated with syphilis, 31 were infants under three months of age, and that of 60 associated with chronic snuffles, 32 were infants under six months. He thought that undue weight was laid on snuffles in out-patient practice as a sign of syphilis, and he regarded craniotabes as rarely due to syphilis, and commonly caused by errors in diet. In his experience the craniotabes described by Elsässer was very rare. It did not follow that a spleen, felt as enlarged in an infant, was of serious import from a diagnostic or prognostic point of view.

**On the Utilization of Infants' Milk Dépôts.**—Dr. T. D. Lister said: "This question involves a matter of direct interest to those who have to practise among the children for whom the dépôts are primarily intended. Those who have to treat the children of very poor and very ignorant parents, or the children of mothers whose employment necessitates a certain amount of child neglect, have to face continually certain difficulties which infants' milk dépôts are designed to overcome. For the wealthier classes no such difficulties exist.

"When the mother is able and willing to feed her child herself, these difficulties of treatment are minimized, for natural feeding and maternal care are the normal preventives of infantile mortality. But it is impossible to be blind to the fact that hand-fed infants form an increasing proportion of the whole infant population. The chief difficulties met with in feeding such children among the poor arise from bad milk supply, ignorance, and lack of facilities for the proper preparation of food. Broadly speaking, as we all know, they are associated with the use of improper bottles, contaminated milk (contamination occurring both in transit and at home), and milk substitutes.

"We are, as a profession, agreed that cow's milk forms the only practicable basis for hand feeding, that it should be pure and fresh and not overtreated either chemically or by cooking, and that the simpler the bottle and teat the better. I do not know what method of meeting these requirements on a large scale can be devised better than this system of infants' milk dépôts. It is recognized by public health authorities that such a system eliminates the many dangers arising from contamination by carelessness either in transit or at home, both of which—and especially the latter—have been proved to be fertile causes of infant mortality, and that it prevents the use of the many abominable milk substitutes that one constantly sees in the infants' dietary. Moreover, it has always been successful in those towns in this country where it has been tried, and there is a very large experience of its success abroad.

"No system of diminished impurity of the fresh milk supply will get over the difficulties of home contamination and carelessness, and those arising from the use of milk substitutes and impoverished milks among a certain class. The system of "certified milk" proposed by Dr. Coutts is very desirable so far as the ordinary milk supply for infant feeding is concerned, but it does not meet the special needs of those among whom infantile mortality from bad hand feeding reaches its highest point.

"It has been pointed out, notably by Dr. Peyroux, that there is a danger of the encouragement of hand feeding at the cost of maternal responsibility under the usual conditions of management of such dépôts. What I wish therefore to bring before you is that it is our duty to lend all our influence and assistance in counteracting this as well as other dangers in the use of milk dépôts. To say that any system of hand-feeding of children, whether "percentage" and other scientific methods, or the simpler methods used in milk dépôts, is as good as natural feeding is to be a contributory to child slaughter. Professor Rotch, who is probably the best living authority on the cow's milk feeding of children, said that no method yet devised was equal to that of Nature.

"Other objections have been raised from time to time to the establishment of infants' milk dépôts, as, for instance, that the method of feeding is not an ideal one. I do not think we need worry about that when the most scientific methods are said by their authors not to satisfy this condition. Infantile mortality among hand-fed children, so far as it may be diminished by careful feeding, is the matter requiring our immediate attention.

"How is this medical supervision of the infants to be secured without affecting the control of the dépôt by the health authorities, and how are we to secure milk dépôts where they are most wanted? To secure effective results they must be placed where they are wanted, and they must be used where they are placed. It is obviously only by the cooperation of the various interests that these results can be achieved, and it is for this cooperation that I think we should work.

"With these pledges of support from institutions dealing with a very large number of necessitous infants the success of a dépôt in their immediate neighborhood is already assured, and the borough council has decided

in favor of the establishment of a dépôt. As I have said, it does not matter to us as a profession where the funds come from to furnish the dépôts. That is a matter for local opinion. There is no doubt that the action of the Local Government Board auditors in disallowing the expenses of the Battersea milk dépôt will soon lead to a clear decision as to the powers of district councils in this matter, but where the district council does not care to undertake the work itself there is no reason why, having once obtained the support of the medical profession in the district, it should not afford information and facilities to charitable bodies on the one hand, or contractors on the other hand to enable them to carry out this necessary work in the districts where it will be most useful. As a mere matter of personal opinion I believe this to be so important a branch of preventive medicine that, properly guarded against abuse by the cooperation of medical practitioners, it should be undertaken by the municipal authorities. That such dépôts would be also of great advantage to us as practitioners in securing a definite method of feeding infants under one year of age carefully and exactly is undeniable in relation to the class for whom we want it. Moreover, their educational influence as to the care required in feeding children would not be the least of their advantages. Example is better than precept, and I anticipate better results from the milk dépôt than from the feeding leaflet.

"All I can claim for the suggestion is that such a method of cooperation would largely remove the objections that have been raised to the establishment and use of infants' dépôts by showing that the infants fed in them were under medical supervision, and that they were believed to be necessary and useful by the medical men in the districts where similar resolutions to those I have mentioned are adopted. It is a confusion of interests which prevents this work being done, and it is a coordination of interests which seems to me, as far as medical interests alone are concerned, likely to help toward its accomplishment."

Dr. Edmund Cautley, in discussing Dr. Lister's paper, said that the question raised by Dr. Lister was of both economic and political importance. He objected to the scheme on the ground that it tended to pauperize the poor, to render them less likely to carry out their proper duties to their children, and because there could be no guarantee that the particular milk would suit the particular child. To carry out the scheme efficiently would require a resident medical officer at the dépôt, constant modification of the food, and systematic weighing of the infants. Even if the scheme were a success, he feared it would then lead to an increase in the neglect of suckling, and ultimately prove injurious It was by no means accepted as an axiom by experts in this country that percentage feeding was the best system for the artificial feeding of infants. He thought it quite the wrong way of attacking the question of infant feeding among the poor. The mothers should be taught, and, in his own experience, they would learn, if they wished to rear their children. If they did not, the scheme proposed would have little or no effect. The most that municipal authorities should do was, in his opinion, to secure a proper supervision of the milk supply, and to provide a clean good milk, which could be obtained by the very poor on a written order from a medical man.

**Discussion on Tuberculosis in Children: Its Relation to Bovine Tuberculosis.**—Dr. Nathan Raw said: "The relation of tubercle bacillus to the many and varied diseases which attack children is not yet thoroughly understood, but I am inclined to think it plays a much more prominent part than we are disposed to believe. What concerns me most in the study of this most difficult problem is, To what extent are these tuberculous lesions produced by cow's milk?

"Professor Koch, the greatest authority on tuberculosis, holds the view that human and bovine tuberculosis are separate and disinct diseases, and that bovine tuberculosis could not be conveyed to the human.

"With the latter part of this statement, I beg in all humility to differ from Professor Koch, and I will endeavor to lay before you my reasons for believing that bovine tuberculosis is frequently conveyed to children by means of milk, and is the cause of a considerable mortality.

"Now it must be admitted that the great body of experimental evidence is in favor of Koch's first contention that the two diseases are distinct, and that it is almost impossible to produce a general tuberculous infection in cattle by inoculating them with human bacilli from sputum. But it does not necessarily follow that because human bacilli have a low virulence for cattle that therefore bovine bacilli have only a slight pathogenic power for man, especially when we consider that bovine bacilli are not only virulent for cattle, but for various other animals, such as the rabbit, horse, dog, pig, and sheep. It therefore appears reasonable to suppose they would be virulent to man, since it is a fact that 'all the disease-producing bacteria that are common to all the domesticated animals are also pathogenic to man' (McFadyean). In short, Koch argues that bovine tuberculosis, being a distinct disease from human tuberculosis, cannot produce the human variety in the body.

"With this view I agree, but I am of opinion that man is attacked by two distinct varieties of tubercle, one conveyed by infection from one person to another, the other by receiving into the body bovine bacilli in milk or meat.

**Two Varieties of Tubercle.**—"During the last few years I have had under observation over 2,000 cases of phthisis pulmonalis, and I have been particularly impressed with the fact that the tuberculous process is nearly always confined strictly to the lungs. The patient usually gives a history, first of cough, then of expectoration; the disease often progresses to death, and the necropsy reveals destructive lesions of the lungs, and nothing more. Out of these cases of phthisis pulmonalis I have only seen the glands and the joints affected in 8 cases, and in the late stages one sees the intestine and peritoneum involved. Phthisis pulmonalis is essentially a disease of young adult life. It is rare to see it as a primary affection under the age of twelve years, the great majority of deaths taking place between the ages of thirty and forty years. On the other hand, strumous or tuberculous joints, enlarged glands, spinal disease, and abdominal tuberculosis with tabes mesenterica, are essentially diseases of infancy and childhood, and are only rarely seen in adult life. I have given particular attention to the clinical manifestations of these various tuberculous affections, and it is rare to see a patient with enlarged glands, strumous joints, or spinal disease develop true phthisis pulmonalis. In fact, clinically they appear to be antagonistic to each other, attacking the body at quite different periods of life, and exhibiting generally opposite symptoms. There are at the present time 118 cases of phthisis pulmonalis in the hospital, and in no case is there any other gross tuberculous lesion present which would certainly be the case if they were all caused by one identical bacillus which would be free to be conveyed all over the body.

"Again, I have had the opportunity of seeing over 500 necropsies on cases of tuberculosis, and I have noticed that even the lungs are attacked by two distinct va-

rieties of tuberculosis—one of a slow and insidious nature, the other rapid and acute, and generally associated with tubercle in other parts of the body. If one compares the appearances seen in cattle dying with tuberculosis with those of children dying of tabes mesenterica and abdominal tubercle, the almost exact counterpart is seen; in fact, as Creighton observes, there is an exact mimicry of disease.

"From these general clinical and pathological observations I am inclined to think that primary intestinal tuberculosis, tabes mesenterica, and other tuberculous affections of the serous membranes in children are probably bovine tuberculosis conveyed by milk, and are not related to human tuberculosis, although the bacillus of Koch is found in them all, and is indistinguishable.

**Tabes Mesenterica.**—"Now let us take first of all tabes mesenterica. By this disease we mean what is popularly called 'consumption of the bowels,' and is one of the most common forms of abdominal tuberculosis in children.

"Infants and children suffer from tuberculosis of the intestines and glands, but it is perhaps more common before the age of two years than afterward. In 103 consecutive necropsies of children dying of tuberculosis at the Manchester Children's Hospital, there was tuberculous ulceration of the intestine in 62, cheesy mesenteric glands in 71, and both ulcers and cheesy glands in 55, tuberculous glands without ulcers of intestine in 7. Ashby states that in at least 70 per cent. of children dying of tuberculous disease of the mesenteric glands was present, and in rather more than 55 per cent. tuberculous ulceration was associated with it, and, he wisely says, primary tuberculosis of the intestine is suggestive of infection by means of tubercle bacilli taken in milk from a tuberculous cow. The figures at the Great Ormond Street Children's Hospital, London, are as follows: In 254 tuberculous children examined post mortem, 151, or 59 per cent., showed cheesy mesenteric glands, and Dr. Still found that in 29 per cent. of cases of tuberculosis in children, primary infection had taken place through the intestine. Woodhead records 127 cases of fatal tuberculosis in children, with involvement of the mesenteric glands in 100.

"My own experience of this affection coincides with these figures, and of 273 cases which I have diagnosed clinically as tabes mesenterica, only 38 have come to post mortem.

"I grant it is extremely difficult to exactly diagnose the onset of tabes mesenterica, and it is not to be assumed that a great many of the cases of diarrhea, wasting, and general inanition in children are tuberculous, as they certainly are not; but I believe that tabes mesenterica is a great deal more common than is generally supposed, and, what is more, a great number of children who receive a mild infection, which is confined to the mesenteric glands, recover absolutely. I have seen this frequently in the hospital, where enlarged palpable mesenteric glands have slowly subsided, and under proper treatment the child has quite recovered. In 5 cases in which I have opened the abdomen during life for hernia and other abdominal disorders I have seen the mesenteric glands much enlarged and apparently cheesy, with sometimes nodules on the peritoneum, yet these children were not suspected of being tuberculous, and they all left the hospital well. Many other surgeons and physicians will be able to confirm this point. Assuming these mesenteric glands to be tuberculous, the question arises, How do the tubercle bacilli find their entrance?

"This difficult problem cannot be proved like an ordinary scientific experiment, since it is impossible to inoculate the human being, and I sincerely hope it will never be attempted. But by carefully considering all the known facts bearing on the question, we ought to be able to find an answer which in all human probability will be approximately accurate.

**Tabes Mesenterica and Milk.**—"I claim your indulgence when I attempt to lay before you all the evidence which I can in support of my view that tabes mesenterica is caused by bovine tubercle bacilli in milk.

"If we consider for a moment the remarkable diminution in human phthisis during the last fifty years, amounting to over 45 per cent., we would naturally expect that other forms of tuberculosis would have fallen in the same ratio were they all caused by the same bacillus. But this is not so; on the contrary, the death rate from abdominal tuberculosis in children as shown by Sir Richard Thorne-Thorne, has greatly increased, amounting to over 20 per cent., and, what is more significant, tuberculosis in English cattle is rapidly increasing.

"Veterinary authorities, such as Nocard, Bang, Dollar, and McFadyean, agree that about 20 per cent. of dairy cattle suffer from tuberculosis, and recent official figures from different parts of England show that in London dairies 25 per cent., in Edinburgh 40 per cent., Midlothian 23 per cent., Durham 19 per cent., and Yorkshire 25 per cent. of the cows are tuberculous.

"If, however, every tuberculous cow produced milk containing living tubercle bacilli, the whole community would be in danger; but it is now generally admitted by experts that only cows wth a tuberculous affection of the udder are really dangerous, and the percentage of such cases is very small, only amounting to 2 or 3 per cent. I have made most careful inquiries during the last five years, and I have never seen a case of tabes mesenterica which had not been fed for some weeks or months on cow's milk. This I consider a most significant fact.

"With a view to excluding infection from parents or family at home I have made a most careful inquiry on this point, and of the 34 deaths only one child had a phthisical parent, so that the probability of infection in this direction is extremely small.

"Now, it is argued by some observers that the tubercle bacilli are not primarily introduced into the body through the mesenteric glands, but that these become affected later on from some other part. If this is so, I ask, How is it that adults suffering from phthisis do not become affected in the mesenteric glands in the same way? It is a fact that they rarely do so, and it is very unusual to see the mesenteric glands affected in phthisis pulmonalis, except as a late affection following secondary intestinal ulceration.

**Similarity of Bovine and Abdominal Tuberculosis in Children.**—"The next link in the chain is the clinical history of a case of tabes mesenterica. In a Poor-law infirmary we often see the child from the commencement of the illness—chronic intestinal catarrh, with diarrhea of offensive yellow stools, with perhaps streaks of blood, a general wasting, and distention of the abdomen. I have examined very carefully several such cases, and have invariably found the chest quite healthy in the early stages of the illness. As the disease slowly progresses, and the atrophy and wasting consequent on the diseased mesenteric glands continues, the general tuberculous symptoms are more pronounced, the temperature becomes hectic, the child begins to cough, and on examination the lungs are found to be tuberculous, and the child invariably dies. The point I wish to make is this: The infection commences in the mesenteric glands from the intestine, slowly spreads to the retroperitoneal glands, then through the diaphragm to the glands in the posterior mediastinum, and finally to the lungs. If the child

lives long enough the brain may be affected too. At the necropsy this process has been corroborated again and again, and I have a case where there was extensive caseation of the mesenteric, retroperitoneal, and portal glands, and only a few grey tubercles at the base of both lungs.

"In nine cases the lungs have not been attacked at all, the disease being confined to the abdomen. If we compare the course of this infection with that seen in the calf which is fed on tuberculous milk, we see an exact mimicry of the disease in every detail. The direction of the lymph stream would certainly be strongly in favor of infection from the intestine to the thoracic organs.

"Passing from the clinical to the bacteriological side of the question, we know that if the various tuberculous lesions in the body are carefully examined the bacillus of Koch is usually found, and, in my opinion, this has led to error in assuming that we were dealing with one bacillus. Koch has shown, I think conclusively, that human and bovine tuberculosis are distinct diseases, but the bacillus of both is morphologically identical and cannot be distinguished under the microscope.

**Probable Non-identity of the Bacilli.**—"On the other hand, the cultures of the two diseases are different, and Professor Ravenal, of Philadelphia, affirms that 'the tubercle bacillus from bovine sources has in culture fairly constant and persistent peculiarities of growth and morphology by which it may tentatively be differentiated from that ordinarily found in man.'

"From a recent case of tabes mesenterica I made cultivations of the mesenteric gland on blood serum with glycerin, and to my surprise the growth exactly corresponded to bovine tuberculosis or Perlsucht. Again from a strumous knee-joint I made a cultivation from the interior fluids of the joint, with an exactly similar result.

"I also inoculated two young heifers with the tuberculous material from a case of advanced hip-joint disease and advanced disease of the knee-joint. They both got thin and wasted, and after four months were killed. At the necropsy there was found in each animal an extensive involvement of the mesenteric glands but no affection of the viscera. Tubercle bacilli were found in the glands of each heifer.

"The experiments recently reported in the British *Medical Journal* by MacFadyean and McConkey are most interesting, and show that active tubercle bacilli are present in a large number of cases not suspected of being tuberculous.

"'The experiments have shown that in the non-tuberculous cases, virulent tubercle bacilli were present to the extent of 25 per cent. The tubercle bacilli, it appears from these experiments, are present much more frequently in the mesenteric glands than ordinary necropsies would lead one to suppose.' This evidence strongly supports the view that I have for a long time held: That a great many children receive a mild infection of mesenteric tuberculosis through cow's milk, and recover absolutely, the infection getting no further than the glands.

**Tuberculous Peritonitis.**—"We have all seen cases of tuberculous peritonitis completely recover after opening and draining the abdomen, and nothing more. So far no satisfactory explanation of this result has been given.

"My opinion is that it is a localized bovine tuberculosis which has died out, and that relief of the fluid is sufficient to cure the patient. Taking all these facts into consideration, I am of opinion that bovine tuberculosis is very virulent for children, and is accountable for tabes mesenterica and other varieties of abdominal tuberculosis; in fact, I believe it to be more virulent for children than human tuberculosis.

"In arriving at this conclusion I lay great stress on the fact that, out of nearly 300 cases of tabes mesenterica observed during the last twelve years, I have never known one to occur in a child which had been fed strictly on the breast, the whole of them, without exception, having been reared on cow's milk for some considerable period.

**Scrofula.**—"We all know now that scrofula, so-called, is nothing more or less than tuberculosis of the lymphatic glands, but is it human tuberculosis?

"I must confess to a difficulty in understanding how it is that these local tuberculous lesions such as enlarged glands in the neck, pulpy joints, and caries of the spine should generally develop in childhood, and in the majority of cases recover and never be heard of again. For it must be admitted that these cases rarely develop tuberculosis of the lung excepting in the process of a general infection.

**Nature of Enlarged Cervical Glands.**—"Out of over 2,000 cases of phthisis I have only seen enlarged cervical glands in 5, and although one occasionally—but very rarely—sees phthisis pulmonalis follow operation on these glands, it might be explained by direct extension of the deep cervical lymphatic glands to the apex of the lung. How many scores of strong, healthy, vigorous children and adults do we see who have suffered from tuberculous glands in the neck with never a symptom in after-life. Surely these people cannot be classed as tuberculous; they have suffered from a mild infection of tubercle bacilli, which was in all probability bovine in origin and absorbed from milk.

"I was particularly impressed when attached to the Dundee Royal Infirmary with the number of strong, healthy, vigorous children from the country districts in Forfarshire who were brought to the hospital suffering from enlarged glands and strumous joints. In many cases general constitutional treatment, with change of air—for change of air means change of cow—produces a cure, or, if necessary, remove the glands or diseased joint, and the child becomes fat, and makes a perfect recovery.

"The most reasonable theory is that scrofulous glands in the neck are produced by the absorption of tubercle bacilli in milk through the tonsils and pharynx, and is, as a rule, a purely local affection. This view is supported by feeding experiments on animals. If pigs are fed on tuberculous milk they invariably develop enlarged tuberculous glands of the neck and throat which on inoculation produce bovine tuberculosis in cattle, and tuberculous lymphatic glands from the human when injected into calves have produced a general tuberculous infection. This is strong presumptive evidence of their being bovine in origin.

"If this view is correct it would help to explain the occurrence of acute general tuberculosis occurring in those suffering from an unhealed focus, such as a gland, a strumous joint, or a psoas abscess, for we are all aware of the danger of operating on a caries of the spine, a tuberculous bone lesion, or removal of glands, lest a general blood infection should follow. If we observe closely this acute general tuberculosis we find it closely resembles that seen in cattle, affecting chiefly the serous membranes and the lungs, a condition which rarely accompanies phthisis pulmonalis.

**Tuberculous Meningitis.**—"It is often a matter of perplexity to the doctor to explain the onset in a previously healthy child of an attack of tuberculous meningitis. Sometimes it is confined to the brain, at others it is part of a general infection. Perhaps it is a bovine tuberculosis, as we have all seen necropsies where

there has been no other discoverable evidence of tubercle. There is also much evidence to suggest that acute miliary tuberculosis is also bovine in origin. I have mentioned a few points briefly with the object of having the opinions of others on this difficult and absorbing problem, and I conclude by expressing the opinion, based almost exclusively on clinical and pathological evidence, that human and bovine tuberculosis are distinct varieties of disease, as shown by Professor Koch, but that the human body is susceptible to both, and especially to bovine tuberculosis in the early periods of life.

"The two diseases are so rarely seen together in the human that there seems to be some ground for presuming that they are antagonistic to each other, and that bovine tuberculosis may possibly confer an immunity against human tuberculosis. If this opinion should prove correct, I venture to submit that it would reconcile the conflicting opinions which have been so frequently expressed during the last two years on this most terrible of all diseases."

W. Arbuthnot Lane said: "I should like to insist on the importance of recognizing that either local injury or disease predisposes to infection. The glandular enlargement, so often seen in children, is much too readily assumed to be tuberculous. Many other causes give rise to it."

**Koch's Announcement.**—Dr. Douglas A. Reid said: "Until the meeting of the British Congress on Tuberculosis in 1901 it was an accepted creed that bovine and human tuberculosis were one and the same disease and that it could be transmitted through meat and milk from cattle to the human subject.

"Then came the bomb-shell of Professor Koch, exploded with great suddenness and with far-reaching effect throughout the civilized, and particularly the medical, world. The eminent professor in starting a new creed used words that will be memorable throughout the ages. 'I should estimate the extent of infection by the milk and flesh of tuberculous cattle and the butter made of their milk as hardly greater than that of hereditary transmission and I therefore do not deem it advisable to take any measures against it.' Inasmuch as the theory of hereditary transmission has now been practically abandoned this must be read to mean that bovine tuberculosis cannot be transmitted to man. Dr. Nathan Raw has advanced a third creed, which somewhat adds to our difficulties in coming to a conclusion in the matter. If there is a 'variety of bovine tuberculosis that can be conveyed by milk from tuberculous cattle' then we are right, and the Government is right and the National Association is right in warning the public to avoid tuberculous meat and milk, and Professor Koch is wrong in advising a contrary procedure.

**Tuberculosis Rare in India.**—"But while experiments and investigations are going on, who can say positively where truth can be found? What has become of the French doctor who inoculated himself with bovine tubercle? It is not my intention to occupy your time with opinions of my own on this subject, but, by the courtesy of Dr. Crombie, I am enabled to contribute some facts and statistics connected with India that may be of value when we come to weigh the evidence for and against the different views that have been advanced. Dr. Crombie submitted a report to the Secretary of State for India on the Congress on Tuberculosis at Berlin in 1899, which was published in the report of the Sanitary Commissioner with the Government of India for that year. This publication is not easily available, and Dr. Crombie has very kindly obtained for me a copy of that part of his report bearing upon tuberculosis in India. It must be borne in mind that a large number of persons die in India without any medical attendance whatever, and therefore in some parts only of the country can statistics be obtained, and one part is in the Northwest Provinces. Here during the year 1897 the cause of death was verified in 15,116 cases by means of the medical staff and a professional agency which voluntarily supplied the required information. Of these 15,116 deaths, 40 only were from tubercle of the lung—6 children and 34 over the age of sixteen years. There were no deaths among children from tabes mesenterica or tuberculous meningitis. The 6 children who died were all under eighteen months. The experience of all medical men in India is that in contrast with that of Europe diseases of the chest, and phthisis among them, take quite a subordinate place in the sickness and mortality of India, and that the tuberculous diseases of children are exceedingly rare among the civil population. Dr. Crombie further reports: 'With regard to tuberculous diseases among children, all authorities are unanimous as to their rarity. Taking strumous enlargement of the cervical glands as the commonest and most obvious form of tuberculous infection in children, Chevers says that he never saw a case in a native of the plains of India.' And other authorities confirm this. Tuberculous meningitis is, however, met with in India, but less frequently than in Europe. Tabes mesenterica is certainly very rare among the civil population. Chevers says that he never admitted a case to hospital. Morehead does not mention it as occurring in the large Byculla schools at Bombay, neither do Webb and Fayrer as regards the Calcutta schools, and the contemporary accounts of the health of the children (mostly Indo-Britons) at the Madras orphan asylums are silent with regard to it. It was at one time, however, apparently very prevalent among the children of European soldiers serving in India. From 1880 to 1883 inclusive there were 162 admissions and 86 deaths from tabes mesenterica among European children in India, while only 3 prisoners and 5 native soldiers were so affected. In 1896 there were no cases in the native army or gaols of India.

"Tuberculous disease of the hip-joint is exceedingly rare. Dr. Crombie never saw a case, nor have any of the medical officers whom he has questioned. From the very interesting statistics in Dr. Crombie's report it is not clear that the great immunity of residents in India, both native and European, so conspicuous in childhood, is extended in an equal degree to adults, at least as regards the conditions under which our soldiers and prisoners live.

"The causes of lesser prevalence of tuberculosis in India are given by Dr. Crombie as follows: (1) The comparative infrequency of bovine tuberculosis in India. (2) The native habit of boiling all milk before using it. No native of India knowingly drinks a drop of unboiled milk. (3) The exclusion of beef from the food of a large proportion of the native population. To the Hindu it is an abomination. Stall-fed beef is unknown in India, even in the large towns. (4) The flesh of the goat is almost exclusively used by Mohammedans, that of the sheep by Europeans. The goat is one of the animals most 'refractory' to tuberculosis. Goat's milk is also much used by the natives. (5) The open-air occupation of the natives. (6) Abstinence from alcohol. (7) The native of India converts all his butter into "ghi" by a process of boiling and skimming, which must destroy any tubercle bacilli it may contain. The European in India eats raw butter. (8) Children in India have this additional advantage over European children (in India) that their mothers al-

most without exception suckle them until they are two or three years old. (9) The comparative infrequency of the diseases which seem most frequently to predispose to tuberculosis—namely, measles, scarlatina, and whooping-cough—which, when they do occur, are milder than in Europe (Ewart).

"The inference to be drawn from the preceding facts is that where the flesh and milk of bovine animals is not much used by the people, and especially where cow's milk, except in a boiled state, is not used for the feeding of children, tuberculous diseases are extremely rare, and that this affords evidence against Professor Koch's contention.

"On the other hand, we have to face the statement, which I suppose we must accept as a fact, that a very large number of milch cows are tuberculous and that the number so affected is increasing. As an increasing number of British mothers refuse to suckle their children we ought to find more tabes mesenterica and tuberculous peritonitis among the children. Dr. Raw says it is so, and this I was not certain about, having no reliable statistics to guide me."

**Contamination of Milk in the Home.**—Dr. John Mackenzie said: "I cannot accept that all the tuberculosis found in children is due to milk infection. The children of the poor are often breast-fed. The mothers believe that while they suckle their children they will not conceive again. The milk is kept in the homes of the poor under conditions that greatly encourage tuberculous infection, if it should be otherwise present in the house. Tuberculous meningitis I have often observed to be due to disease of the middle ear. The enlargement of cervical glands may be due to scarlet fever, diphtheria, and septic sore throat. Hence we must not rush to the conclusion that all large cervical glands are tuberculous."

**Possibility of Primary Abdominal Infection.**—Dr. Theodore Fisher said: "I think Dr. Nathan Raw takes too extreme a view. I do not, of course, deny the possibility of primary abdominal infection, or that such infection is sometimes of bovine origin, but that infection through the respiratory tract is far in excess of that through the alimentary tract my own experience seems to leave no shadow of doubt. Statistics may be quoted of the relative frequency of infection of the bronchial and mesenteric glands from Germany, France, and America, which present the matter in a different light from that given by Dr. Raw. In my experience the primary or only focus of infection is, in the great majority of instances, in the bronchial glands. Extension of infection from the mesenteric to the bronchial gland must be extremely rare. I can mention cases showing that tuberculosis peritonitis and other forms of acute or subacute tuberculosis of abdominal organs may occur where the only caseous focus is in a single bronchial gland hidden within one lung."

Dr. W. Langford Symes said: "I wish to ask Dr. Raw what he actually means by tabes mesenterica. Dr. Raw quotes 273 cases of tabes. There are three forms of abdominal tuberculosis usually seen—namely: (1) Tuberculous peritonitis, of two or three kinds; (2) tuberculous ulceration of the bowels; (3) tabes mesenterica where the glands alone are affected. This latter is in reality the rarest of all kinds, and the use of this term frequently gives rise to misunderstanding."

**Double Infection.**—Dr. Edmund Cautley said: "In one point I agree with Dr. Nathan Raw, namely, that probably the bovine bacillus gives rise to a different form of tuberculosis to that produced by the human bacillus, and that children are subject to both kinds of infection. I differ from him in regarding infection by the bovine bacillus as of comparatively rare occurrence. It is with the greatest regret that I hear Dr. Raw perpetuating that unfortunate name 'tabes mesenterica.' It has led to endless confusion, and, on the grounds of scientific precision, should be omitted from the nomenclature of the tuberculous affections. I am still more astonished to hear him quoting Sir Richard Thorne-Thorne's statistics of tabes mesenterica in support of his views. Time after time it has been pointed out that these statistics are absolutely valueless. They were taken from the Registrar-General's reports, and it is well known that in those reports all cases certified as deaths from 'consumptive bowels' are included under the heading of tabes mesenterica. This is absolutely misleading, for almost all cases so certified are nothing more nor less than cases of marasmus due to diarrhea and vomiting, from unsuitable feeding, and ending in death. I am not inclined to accept the statement of veterinary surgeons that about 30 per cent. of English cows are tuberculous. Such a statement may be true of highly-bred pedigree stock and of old milch cows kept under unsuitable conditions, and yet be absolutely inaccurate of younger cows kept in healthy country surroundings. Even accepting it as true, the result is probably based on the reaction to tuberculin, and does not indicate that the milk is likely to be infective. The fact that many children get a mild infection and recover is to my mind an argument of no value in favor of the views of Dr. Raw. The liability to infection by the human bacillus is enormous in the conditions under which the very poor live, and the milk may be infected by the human as readily as by the bovine bacillus. From the experience of a large hospital practice for many years I have derived the impression that tuberculous meningitis diminishes in frequency in proportion to the increased use of cow's milk in infant feeding. Certainly the proportion of such cases has very much decreased in my experience under such conditions. I regard condensed milk as a potent factor in the etiology of tuberculous affections, by lowering the vitality of the child, and rendering it more susceptible to infection by the human bacillus. As to infection via the alimentary tract in opposition to infection through the pulmonary system, I should like to quote the result of 27 necropsies on cases of tuberculous meningitis. In 25 instances the state of the mediastinal and mesenteric glands was noted, and in no less than 23 were one or more of the mediastinal glands caseous. In 4 out of these 23 the mesenteric glands were also caseous, but in none were they the only ones involved. On the whole, it seems to me that up to the present we have no justifiable grounds for concluding that tuberculous milk is a serious source of infection."

**Primary Infection of Glands.**—Dr. George Carpenter said: "Certain cases of tuberculosis are, in my opinion, primarily abdominal. If infection of the lungs takes place in these cases, it is probably secondary, and by way of the thoracic duct. Other channels of ingress are, however, much more usual avenues of infection. In a case of enteric fever with an intestinal ulcer and enlarged mesenteric glands, I found both tubercle and typhoid bacilli in the glands. This proves conclusively that primary infection of the glands can occur. Dr. Raw has not called attention to a well-known occurrence in these cases of a sound mucous membrane with advanced caseous disease of the mesenteric glands. I object to the loose term tabes mesenterica, a nomenclature which should be abandoned. I have in a large experience only seen two cases of glandular disease which could be fairly called tabes mesenterica. The common clinical state is a mixed condition of tuberculous peritonitis, tuberculous ulcers, and caseous mesenteric glands, which can be detected as fixed abdominal

lumps. I should like Dr. Raw to say what he really means to convey by the term tabes mesenterica. I think that many cases of dyspepsia in infants and young children are unwarrantably described as cases of tabes mesenterica. Are Dr. Raw's experiences clinical or pathological? I call attention to the importance of making a combined rectal and abdominal examination in doubtful cases. It is possible in this way to determine the presence of tuberculous peritonitis. Dr. Raw has spoken of abdominal section in these cases. I consider abdominal section unjustifiable, and all that is necessary in some cases of ascites when there is considerable distention by fluid is the simple operation of paracentesis abdominis, preferably by Southey's trocar and canula. Abdominal section should only be undertaken when there is pus in the abdomen or for the relief of intestinal obstruction. Dr. Raw has stated that he has never seen a case of abdominal tuberculosis which has not been fed on cow's milk. My experience is somewhat different, as I have met with two primary cases in breast-fed infants. In one of them the appearance was that of simple chronic peritonitis. The false membrane could be stripped off the intestines, leaving a polished surface, and it was not until a microscopical examination was made of this membrane that its tuberculous nature was recognized—it was crowded with tubercle bacilli."

**Glandular Invasion Secondary to Trauma.**— Mr. Adam Eccles said: "I wish to emphasize the remark which fell from the President that, from a surgical point of view, there seems to be much evidence that there is a lesion prior to the infection by the tubercle bacillus. I think that there might be direct infection through the blood stream, without involvement of the cervical glands, of both meninges and of joints. So many children suffer from lesions of the tonsils and nasopharynx that it would seem possible, even probable, that bacilli in milk may be arrested and imprisoned here, and become directly absorbed. In tuberculous peritonitis, if there is no secondary infection, recovery would seem to be the rule, and therefore the question of a primary tuberculosis of the abdomen is important from a point of view of prognosis."

Dr. Nathan Raw, in closing, thanked the members of the Section for their criticism of the points raised in the paper, and read a letter from Professor Madden (Cairo) supporting his view that children in Egypt were not often attacked with tuberculous glands or abdominal tubercle owing to the general custom in Egypt of suckling the children up to the age of two years. He was strongly of opinion that tubercle spread from the abdomen to the lungs in children a great deal more frequently than vice versa. He concluded by affirming the view that human and bovine tuberculosis were different species of tuberculosis, and that the child was more susceptible to bovine than human infection, and that the general mode of infection was by the ingestion of tuberculous cow's milk.

## BOOK REVIEW.

Findley's Gynecological Diagnosis. The Diagnosis of Diseases of Women. A Treatise for Students and Practitioners. By Palmer Findley, M.D., Instructor in Obstetrics and Gynecology in Rush Medical College, in affiliation with the University of Chicago. In one octavo volume of 494 pages, richly illustrated with 210 engravings and 45 full-page plates in colors and monochrome. Cloth, $4.50, net; leather, $5.50, net. Lea Brothers & Co., Philadelphia and New York.

At a time when prominent men are talking of the "passing of the specialty," and the cry is raised in some quarters that Gynecology has no more worlds to conquer, the appearance of a volume devoted exclusively to *gynecological diagnosis* is an evidence of faith, in at least some quarters, that gynecology still retains a goodly modicum of reserve force and staying qualities. This confidence is not misplaced. There is a future for the specialty as well as a lustrous past. It will consist in elaborating technic and in perfecting diagnosis. In the latter particular the book before us is a step in the right direction, and worthy of all commendation. If the author has made any mistake it is in the endeavor to cover too much ground, rather than elaborate to the last detail, and spend his time upon, conditions particularly difficult of diagnosis. The author's directions for digital examination of the internal genitals is a case in point, especially the combined or bimanual method. The method is extolled as "the most valuable of all physical explorations of the pelvis," and considerable time is expended in telling what can and what cannot be done, but it is doubtful if anyone, by reading this chapter, would gain much insight into how, practically, to apply the method. The picture on page 59, purporting to illustrate the method, is altogether faulty. The table is too high and the operator too far away from the patient. Working at arm's length and at so high a reach it is impossible to make efficient pressure either in the vagina or on the abdomen; it is no wonder that the list of things that cannot be done is long. The same criticism, in a general way, will apply to the chapter on displacements of the uterus. The illustrations of the conditions are clear and instructive, but the explicit directions for their detection are not so lucid.

As the author truly says: "The recognition of the pathology of the pelvic organs in large measure constitutes a diagnosis." Acting upon this principle he has incorporated a thorough discussion of the morbid anatomy, both macroscopic and microscopic, and added valuable suggestions on the clinical indications. Special stress has been laid upon the microscopic findings in the various lesions, emphasizing the fact that "without the microscope a diagnosis is not always possible."

The chapter on ectopic pregnancy elaborates the subject well; it is beautifully illustrated, is concise and clear. The diagnosis of pregnancy, especially in its early stages, and abortion, is most apropos. In Chapters XVIII and XIX may be found a very instructive discussion of that rare condition of hydatiform mole and chorio-epithelioma malignum, more commonly called deciduoma malignum. In the discussion of cancer of the uterus the author follows closely Cullen's masterful presentation of that subject. The chapter points out emphatically the importance of early diagnosis—prompt and thorough examination, both macroscopic and microscopic, in all cases presenting the least suspicion of malignant tendencies—and tells how to do it. The diagnosis and pathology of diseases of the ovaries are fully presented—this is one of the best chapters—and the book closes with a brief treatise on the urinary apparatus, the urethra, bladder, ureters, and kidneys.

The book, as a whole, is an agreeable résumé of what is presented in the various text-books on gynecology. There is nothing new presented and nothing impressive or remarkable in the manner of its presentation. But some valuable hints are dropped here and there; the index is full and complete, and altogether, the work affords a reliable and convenient reference book covering the entire field of gynecological diagnosis.

The volume has a most attractive appearance, is generously illustrated, and does credit to the publishing house from which it emanates.

# THE MEDICAL NEWS.

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## ORIGINAL ARTICLES.

### CONCERNING SOME POINTS IN THE TREATMENT OF TYPHOID FEVER.*

BY GLENTWORTH R. BUTLER, A.M., M.D.,
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WITH regard to the treatment of typhoid fever, I wish to speak concerning diet, the use of cold and the employment of drugs. The following statements are for the most part based simply on personal opinion and experience:

*Diet.*—Notwithstanding severe criticism, milk remains the best article for the basis of a typhoid fever diet. It has been condemned as an excellent culture medium for the bacillus, scored because of forming indigestible curds, and accused of being responsible for fermentation and excessive tympanites. All of these consequences and faults can undoubtedly be attributed in varying measure to the exclusive milk diet, but the acknowledgement simply emphasizes the fact that no one article of food is at all times and under all circumstances the best and most suitable for a patient with typhoid fever. Many patients have gone smoothly and uneventfully through the whole course of the disease without taking a particle of nourishment other than milk, but the sameness of the diet becomes excessively monotonous and at times revolting. On the other hand, there are some persons who, I am satisfied, have an idiosyncracy for milk and will vomit it, or, if it is retained, will digest it with distress and difficulty.

By a gradual process of development I have come to include the following articles in the routine typhoid fever diet: The administration of milk may be much varied. Thus we may give milk, milk and mineral waters, buttermilk, koumyss, oyster and clam soup made with milk, milk made into soup by salting, peppering, and heating with a little butter, hot milk flavored with a little strong, black coffee, or cold with a small quantity of whisky, brandy, or rum, or a sprinkle of red pepper. The latter is liked particularly by patients who are in the habit of drinking spirits. It is understood that the stools are daily scrutinized for undigested curds. If such appear the milk may either be stopped, or diluted one-half with water, plain or mineral, or peptonized by the cold process. In every case, if the patient is accustomed to drinking coffee, tea (hot or iced) or cocoa, these are allowed once or twice daily. With many persons the prohibition of these accustomed beverages is a serious, and, I believe, an unnecessary and harmful deprivation. In all cases lemonade, orange juice or grape juice are not only allowed, but their use encouraged, unless there is a troublesome diarrhea. Mutton, beef, and chicken broths, bouillon, consommé, or other clear soups are also given in moderation, unless, as with fruit juices, the bowels are moving too freely. Albumen water, the whites of eggs, mixed with an equal or somewhat greater amount of cold water, strained through a cloth, acidulated with lemon juice, and flavored or not with spirits, is often useful. The white of the egg or the whole egg may be beaten with milk and employed, a little sparingly perhaps. Barley gruel, thin and well strained, is a good food and relished by some, especially if well salted. Plain ice-cream, water ices and jellies are, as a rule, unobjectionable. Lactose, sugar of milk, is a valuable force producer, and as it is both soluble and wellnigh tasteless, can be given to great advantage one or two, or more, ounces daily, dissolved in milk or water.

The foregoing list affords possibilities, not only in degrees of digestibility and nutritive value, but in variety, and the latter is of no small importance, except in those patients who are dull and delirious. The physician at each visit should carefully arrange the hours of administration, the amounts, the kinds, and the sequences of the nourishment to be given, writing it out in detail, if necessary. There is a distinctly better morale when the invalid's palate is consulted, even though the sense of taste be measurably blunted. It is doubtless often the case that in our anxiety to maintain the nutrition of the patient at its highest point we give more food than can be digested or utilized. A persistent feeling of gastric discomfort, or overfulness, nausea, tympanites, or, if the diet contains milk, the appearance of curds in the stools, should be the signal for alterations in the schedule of nourishment designed to correct the symptoms of imperfect digestion. The milk may be cut out altogether or lessened in amount, or diluted, or peptonized, or other fluid foods may be temporarily diminished in quantity or frequency. Cases have been known to do very well on water alone for several days.

Water should be given just as regularly as food. This, to me, is a matter of great importance, because it is an effectual and indispensable means for keeping the total daily output of urine not only up to, but above, the normal daily average. It has been shown that the kidneys are the most efficient excretors of typhoid toxins. The experiments of Ingelraus and Dehon on the toxicity of the urine in three groups of cases of typhoid fever treated respectively by warm baths, cold baths, and the ingestion of large amounts of water, are of much interest in this connection. The toxicity of the urine was least with the warm baths, and greatest in patients who drank large

*A portion of a paper read before the Brooklyn Medical Society.

quantities of water, proving very satisfactorily that elimination of toxins was better accomplished by increasing the excretion of urine than by cold or warm baths. Water should, therefore, be given systematically, 6 to 12 ounces, or even more, if it does not incommode the patient, every two hours. Except in the mildest cases it is also desirable to give by rectum, once or twice daily, half a pint to a pint of warm normal saline solution.

With regard to the use of solid food, I believe most firmly that it should not be allowed until three days of normal temperature have elapsed, and in particular that no meat should be given until ten days of freedom from fever have passed. No one will ever regret the observance of this rule; many have bitterly mourned its non-observance. I am very well aware of the good authority for the giving of solid food, not only as soon as the patient desires it, but even during the course of the fever. Nevertheless, I have seen too many recrudescences of fever, particularly after the too early taking of meat, to be shaken in this opinion. Not without cause did the term *febris carnis* come into being; moreover, when one has seen an autopsy or two where nothing intervened between the patient and a perforation but an almost transparent film of peritoneum forming the floor of a typhoid ulcer, he is apt to meditate upon the not unlikely consequences of the passage of a tiny spicule of bone from a mutton chop, or a sharp seed case from an apple, or perhaps a solid piece of imperfectly cooked, poorly masticated or ill-digested vegetable or meat.

After the third day of normal temperature milk toast or crackers softened in milk, soft boiled or poached eggs, boiled rice or rice pudding thoroughly cooked, jellies, ice cream, oysters, baked potato, in general a farinaceous and fluid diet, may be allowed. After the tenth day, chicken, beef, steak and chop may be added.

*Hydrotherapy.*—So far as personal observation may be trusted, it would appear that the routine use of the cold tub in typhoid fever is not so common now with many good men as it was a few years ago. This is so not alone from the fact that in private practice the method is so troublesome and expensive as to be practically unavailable in the majority of cases. Even in hospitals, with the ready outfit and ample supply of trained attendants, cold tubbing is by no means so frequently employed, so that this change in the therapeutics of typhoid fever, while sufficiently marked to be noticeable in papers and discussions, is not due simply to the practical difficulties of cold bathing. The mild cases, with fever not exceeding 102.5° F., do not require it; a majority of the severer cases get along not only very well, but distinctly better with gentler means; and in a measurable proportion of patients tubbed, the cold baths have to be omitted because of a lack of proper reaction, even though the technic of the bath is as perfect as the most minute attention to details of the best practice can make it. Personally for the robust, strong-hearted, full-blooded type of man or woman I still employ it from the beginning, when practicable; for others it is best to begin, and continue, if the results are satisfactory, with less heroic hydriatic procedures, which involve the minimum of physical and mental disturbance to the patient, reserving the right to shift to the cold tubbing if the end and aim of the use of cold water is not attained by the less disagreeable measures.

It should be distinctly understood that the reduction of temperature is not the main object of the hydriatic treatment in typhoid fever. On the contrary, lowering of the fever, although desirable and often a good gauge of the effect of the treatment, is of quite secondary importance to the tonic and stimulating effect of cold with friction, upon the heart and arteries, the respiratory tract, and the functions of the nervous system, as well as the increase of the urinary excretion and its toxicity. Cold with friction of the surface should be emphasized, as one without the other is of comparatively slight service in attaining the desired results, viz., to counteract the effect of the toxins upon the nervous system and increase their elimination and destruction.

For the application of cold the following methods can be commended. The details are important:

1. Cold Mitten Rub.—Required: A rather rough bath mitten, a bath thermometer, a vessel holding a gallon of water, reduced to a prescribed temperature by ice, a rubber sheet, a blanket, a linen or Turkish sheet, and a couple of towels. The rubber sheet covered by the blanket is placed under the patient, the body clothing removed, and the sheet placed over him. The face, head and neck are wet with cold water, or, in women, a wet napkin is placed over the face. The front of the thorax is then uncovered and the nurse, dipping her mittened hand into the water, rubs the surface vigorously until it is well reddened, frequently redipping the mitten in the water. When a good reaction of the skin is secured, the thorax is quickly rubbed dry with a towel. The remainder of the body is similarly treated, in order, right arm, left arm, anterior aspect of legs, then, the patient having been turned upon his face, the back, and posterior aspect of the legs. The mitten rub may be repeated at intervals of three to six hours when the fever reaches or exceeds 102.5° F.

For the first rub the temperature of the water may be 85° F., for the second 80° F., for the third 75° F. Usually 65° F. is the lowest temperature required, but the water may be reduced to 45° or 40° F. if greater stimulation is necessary. The cold mitten rub has given tonic effects quite as good as those of the cold tub with a very desirable minimum of disturbance to the patient. It has a very different action from ordinary sponging, in which the surface of the body is merely moistened with cold water, applied by a soft cloth, without friction.

2. Towel Bath of Baruch: For the employment of the towel bath, the bed is prepared as for

the mitten rub. Required are two linen towels, a large cup, a sponge, a basin of water at 85° F. and another at 70° F. The patient is turned upon his abdomen, a towel having been dipped in the 85° F. water, is, without wringing, laid smoothly over the entire back, gluteal regions and thighs, using both towels if one is not large enough. With the cup, the water at 70° F. is poured over a part of the back, *e.g.*, the upper left, and this part rubbed vigorously with the flat hand until the surface is felt to be warm, and another cup of water poured on followed by more rubbing. This may be repeated three times unless the part does not become warm. The remaining parts of the back and the thighs are gone over in a similar manner and carefully dried. The patient is then turned on his back and the procedure repeated over the anterior portion of the body and thighs. From time to time, as required, the water which has flowed upon the blanket is sopped up and removed with the sponge. According to indications the towel water may be reduced to 60° F. and the cup water to 50° F.

3. The Ice Rub: The ice rub is distinctly more vigorous in its action and like the cold tub requires discrimination in using. The bed having been prepared with the rubber sheet and blanket, the patient may either be wrapped in a sheet dipped in 85° F. water, or the wet towels may be used as in the towel rub. But instead of pouring water on, a part of the surface is rubbed with a flat, smooth piece of ice, held in a wash-cloth, followed by friction with the flat hand until it warms up. This is to be repeated until the part remains cool. The whole body is successively gone over in this manner, and carefully dried.

The first method, the cold mitten rub, will suffice for nearly all cases. If a more refrigerant and stimulatory procedure seems necessary, the towel bath may be used, and, finally, if required, the ice rub. The nurse should promptly stop the giving of any one of these hydriatic measures if the patient's teeth begin to chatter. Complaints of simple chilliness may be disregarded.

During the intervals between the cold rubbings, a wet compress to the abdomen is highly recommended by hydrotherapeutists, although I have seldom employed it. It is applied by cutting three thicknesses of old linen to fit the front of the body from the lower end of the sternum to the pubis, and wide enough to lap over the sides of the abdomen. This compress is dipped in water at 65° F., wrung out so as to be moist without dripping, and smoothly applied, the gown having been rolled up out of the way. The compress is now covered by a flannel binder, of a size sufficient to pass completely around the body, and to overlap the wet compress by an inch or more, above and below. It may be secured by safety pins in the ordinary manner. It is to be renewed every hour.

*Prophylaxis Against Relapses.*—Owing to some favorable statistical reports, for the most part from German sources, it is extremely desirable to employ certain preventive measures against relapses. These measures are based upon the reasonable ground that reinfection may occur from the outside, especially from the hands of the patient. In addition to cleansing the hands and arms with a disinfectant solution, the finger nails should be cut short, and the hands scrubbed twice daily, with soap and water, followed by two or three minute immersion in a warm 1-1,000 bichloride solution. In a limited number of personal cases, no relapses have occurred when this has been done. In fly-time sedulous care should be taken to keep flies from the patient by bed and window screens, and to keep food and utensils covered to avoid their contamination by these pestiferous insects. This precaution is in the interest, not only of the patient, but as well of the attendants and residents in the building.

*Medicinal Treatment.*—It is probable that most cases of typhoid fever are overmedicated. It is simply appalling at times, even in hospital service, to see the list of remedies grow in bulk, by almost imperceptible additions at each visit of the physician, and it may require considerable self-control not to yield to the natural impulse which urges one to relieve or to meet every indication, whether important or not, which may arise. This piling up of remedies is extremely apt to disorder the stomach and to cause certain incidental untoward and undesirable by-effects. Many cases of typhoid fever do best with little or no medication, but at the same time I have no sympathy with therapeutic nihilism, and in the face of gradual cardiac failure, pneumonic complications, intestinal hemorrhage or similar serious developments, no one need hesitate to employ heroic medication if it seems necessary. There is neither reason nor humanity in allowing a case to progress steadily toward a lethal ending without employing medicaments which have proved indubitably life-saving in many instances.

There are but two points in medicinal treatment of which I wish to speak—intestinal antisepsis and the checking of intestinal hemorrhage.

Few well-informed men now expect to accomplish anything in aborting typhoid fever by destroying the bacillus in the intestines. The proved presence of the germs in the blood and internal organs forbid any such anticipations. Nevertheless I am satisfied from clinical experience that the ordinary putrefactive and fermentative changes which take place in the intestinal tube can be favorably modified by antiseptics, and that in consequence excessive tympanites, always an event to be deplored and dreaded, is of much less common occurrence when suitable remedies are systematically employed. Among eligible intestinal antiseptics are salol, guiacol carbonate, creosote carbonate, zinc or sodium sulphocarbonate, bismuth, and turpentine. These may be given in moderate doses at intervals of four to six hours. An initial dose of calomel is desirable, and during the course of the disease, especially when constipation exists and the stools are fetid, small doses of calomel 1-5 to 3-5 gr. with 1-10 to 3-10 gr. of ipecac and a little sodium bicarbonate

have often proved of good service in lowering temperature and relieving general and gastro-intestinal discomfort. As a rule daily enemata are sufficient.

For the medical treatment of intestinal hemorrhage three remedies have proved to be of much value. The first two, which act by increasing the coagulability of the blood, are calcium chloride and gelatin; the third, an arterial constrictor, is the powdered suprarenal or its active principle, adrenalin. A pint or more of a 10-per-cent. solution of gelatin may be given in the twenty-four hours; 20 to 30 grains of calcium chloride every two to four hours; and 5 or more grains of the desiccated supranenal every four hours, up to half a dram in twenty-four hours. The results have been sufficiently encouraging in personal cases to make the administration of these remedies a routine measure, in preference to the opium, ergot and lead of former treatment. The use of moderate doses of opium or its alkaloids is always advisable in order to quiet the restlessness and excitement usually attending internal hemorrhage, and to sustain and regulate the action of the heart.

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## NOTE ON TYPHOID FEVER AND SCARLET FEVER WITH SPECIAL REFERENCE TO THE DIAGNOSTIC VALUE OF BLOOD CULTURES.*†

BY LUDVIG HEKTOEN, M.D.
OF CHICAGO.

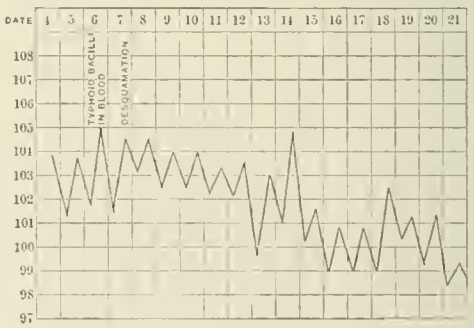
This brief communication is written for the purpose of calling attention to two points, first, the possibility of mistaking typhoid fever for scarlet fever on account of early rash and angina, as well as the possible coincident occurrence of these two diseases in the same person; and, secondly, the value of bacteriological examination of the blood in determining in such cases the existence of typhoid fever.

Recent investigations have shown that in the early stages and during the height of the attack of typhoid and paratyphoid fever the specific bacilli occur in the blood so constantly and in such numbers that they are readily demonstrable by cultural methods. Such appears to be the case also at the beginning of relapses in typhoid fever (Schottmüller, Rüdiger). In many respects this is the most important recent advance in our knowledge of these diseases, and bacteriological examination of the blood according to the modern methods of several inoculations of 1 c.c. or so of blood into many times that quantity of medium constitutes the most valuable diagnostic measure of these fevers at the periods mentioned. Repeatedly have bacilli been demonstrated in the blood many days before the appearance of specific agglutinins.

According to Curschmann‡ the concurrence of scarlet fever and typhoid fever has been described by Taupin, Murchison, Glaser and Eichhorst. In Murchison's and Glaser's cases, scarlet fever seems to have developed in the second or third week of typhoid fever, and Curschmann remarks that most frequently in this association the development of scarlet fever is secondary. In the following case it is reasonable to believe that scarlet fever and typhoid fever developed very nearly at the same time. At all events, the onset, the angina, the rash, the tongue, and the desquamation were quite distinctive of scarlet fever; and the demonstration of typhoid bacilli and of specific agglutinins in the blood as well as the subsequent course of the disease leave no room for doubt as to correctness of the diagnosis of typhoid fever.

*Case I* (No. 185).—Woman, aged twenty-two years; married; housewife; was admitted to Dr. Baum's service in ward No. 26, Cook County Hospital, on October 12, 1902.

The history (Dr. Otradovec) states that she was taken suddenly ill three days before admission with nausea, malaise, headache, pain in the limbs. The throat began to swell, became red, and deglutition was difficult and painful. On the following day a rash appeared on the neck and body, spreading to the limbs and face. The examination at the time of admission showed a diffuse erythematous rash on the neck and body, face and limbs. There was a deep, subcuticular flush with raised points. The tonsils were enlarged and swollen, but without membrane; strawberry tongue. On October 14, cultures of the blood were made and the typhoid bacillus occurred in pure growth. The serum was then strongly agglutinating for typhoid bacilli. On October 15 it is noted that typical scarlatinal desquamation was going on. On October 18 the




Case I.—Temperature Chart.

spleen was palpable; there were numerous raised spots on the abdomen; quite frequent bleeding from the nose; headache persisted; the bowel movements frequent.

Recovery took place after a typical typhoid course, the temperature falling to normal about the twenty-first day.

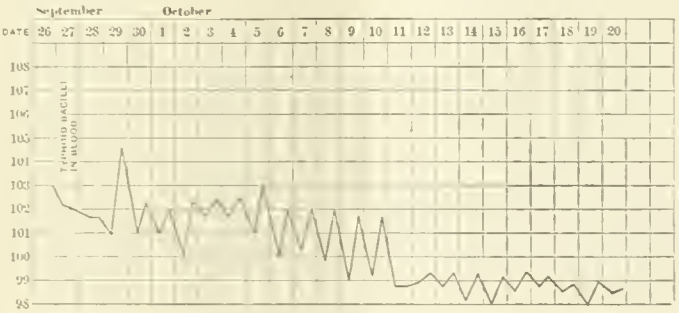
It must be granted that the skeptic might find room for questioning the correctness of the diagnosis of scarlet fever in this case. As stated,

* From the Memorial Institute for Infectious Diseases.
† Presented at the meeting of the Association of American Physicians, May, 1903, Washington, D. C.
‡ Nothnagel's Specielle Pathologie u. Therapie, 1898, III B., I Theil, 303-304.

the onset, the angina, the rash, the tongue, and the desquamation seemed distinctive of scarlet fever, but in the absence of absolutely conclusive evidence, such, for instance, as would be furnished by the demonstration of the etiological agent, one could not successfully disprove the claim that all the symptoms were caused by the typhoid fever. But general desquamation does not seem to occur, at least in the lighter forms of typhoid erythema. In his valuable paper on "Anomalous Eruptions in Typhoid Fever," the late Da Costa* states that the scarlatiniform eruption in typhoid passes away without desquamation. The occurrence of desquamation in this case seems to be, therefore, to support strongly the diagnosis of scarlet fever.

It may have been cases of this kind that gave rise to the following description by Thomas of "scarlatina with a course similar to typhoid fever," which I give word for word with Von Jürgensen's comments, as translated in the American edition of the latter's work on scarlet fever in Nothnagel's system:

"By no means seldom occurs still another form of the disease, characterized by slight or moderate




CASE II.—Temperature Chart.

localizations, and by disproportionately severe and very long-drawn-out fever. The latter feature, together with the considerable intensity of the pyrexia, warrants the term 'scarlatina, with a course similar to typhoid fever.'

"Evidently in this form the fever is of major, and the local affection of minor, importance, although at times nothing more than a protracted local disturbance appears to cause the continuation of the fever into the fourth week and longer.

"The *eruption* in this form of scarlatina appears usually after a hyperpyrexia of several days' duration, which follows a sudden initial fever. It is often unusually slight; otherwise it develops according to rule. The *angina* is second in importance of the local affections, and is also frequently of no consequence. It is, as rule, present in advance of the exanthema. Notwithstanding these facts, *brain symptoms and fever*, especially in the beginning of the disease, are not infrequently quite marked; the expression is vacant, thirst severe, and the tongue tends to dryness, yet clearing itself in a characteristic manner. Some cough may be present, and the skin, which, after the fading of the exanthema has desquamated as usual, remains dry and hot. Later the patient is apathetic, and in addition to some slight affection of the organs of hearing, is usually deaf. The spleen swells somewhat, *hypostasis may occur in the lungs*, and the bowel movements are of the nature of a diarrhea. As a rule, no local affection other than a moderate enlargement of the cervical lymphatic glands is perceptible in connection with the remittent fever of weeks' duration."

Von Jürgensen adds: "Nephritis may appear in the third week, and, according to Thomas, determines, when present, the character of the fever."

At the autopsies of the subjects dying in the latter periods of the disease one notes, it is stated, besides the usual involvement of the pharynx, the lymph glands, the skin, and perhaps also the kidneys, "hyperemia of the brain, slight turbidity of the meninges, catarrh of the air-passages and pulmonary hypostasis, transudations into the serous cavities, the liver and spleen full of blood and often swollen, marked floccular involvement of the intestinal tract, and infiltration of its mesenteric lymph glands; sometimes also Peyer's patches are swollen in a manner rather similar to typhoid fever. It is by no means certain that in these cases there is a real complication with enteric fever."

The last remark by von Jürgensen, it would seem, probably does not state the case correctly—it may well be that in some at least of these cases there is a real complication with typhoid fever.

Jochmann* reports a secondary infection with a paratyphoid bacillus in a girl, aged seven years, with undoubted scarlet fever, ending in death on the sixteenth day. Cultures from the blood on the fifteenth day gave a few colonies of streptococci and numerous colonies of paratyphoid bacilli. This result was obtained again after death. There were no special intestinal lesions. In this case there seems to be little or no reason to doubt the diagnosis of scarlet fever—the onset was sudden with vomiting and tonsillitis followed by a pronounced eruption, marked enlargement of the cervical glands, and on the ninth day desquamation.

In the two other cases that I report are prob-

* Transactions American Association of Physicians, 1899, XIV, 89-98.

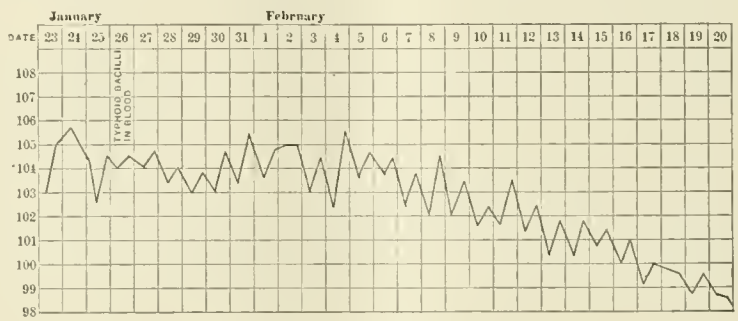
* Centralbl. f. Bakt., Referate, 1903, XXXIII, 8-9.

ably instances of early angina and erythema in typhoid fever.

*Case II* (175).—E. G., single woman, aged twenty-six years, suffered from headache and backache for three or four days, feeling now chilly and then again warm. On the fifth day she remained in bed; about this time she noticed a distinct rash, and there was pain in the throat. With this history she was brought to the Hospital of the Memorial Institute for Infectious Diseases and admitted by the interne as a case of scarlet fever. At the time of admission there was a faint rash on the chest. The cultures of the blood showed pure growths of the typhoid bacillus, which was agglutinated by the patient's serum. This serum also agglutinated in high dilution stock cultures of typhoid bacillus. The patient was transferred to the Presbyterian Hospital and passed through an uncomplicated attack of typhoid fever of moderate severity, ending in recovery. *There was no desquamation.*

*Case III* (238).—J. E., trained nurse, aged twenty-seven years; entered ward 26, Cook County Hospital, Jan. 23, 1902, with diagnosis of scarlet fever. According to the history (Dr. Snyder), the illness began rather suddenly, although the patient had not been feeling wholly well for some time before, becoming easily tired and not having as good an appetite as formerly. This she traced to her being on night duty. The actual onset of the attack is described as marked by headache, backache, and prostration. This continued for fully two days, during which she remained on duty, but in the evening of the second day she was forced to go to bed on account of the intensity of headache and backache; there were now present also anginal symptoms; the face was flushed, and there was noted by the nurse who looked after the patient a generalized erythema, which seemed to be typically scarlatinal. The pharynx was congested, but there was no membrane. The temperature at this time was 103.8° F. On the following morning (Jan. 23) she entered the service of Dr. Baum, in ward 26. Examination showed a well-nourished and well-developed young woman; she is somewhat exhausted, but not in any special distress and clear mentally. On the neck and chest is a diffuse red rash with punctiform spots. Mouth and lips dry, tongue brownish, fissured. Tonsils prominent, faucial pillars congested, no membrane. The cervical glands appear a little large. Thoracic organs apparently normal. The patient complains of tenderness on palpation of the abdomen, most marked in the iliac region; the abdominal walls are somewhat rigid. Spleen not palpable. Blood cultures were made Jan. 26, three days after admission, five drops of blood being added to each of two flasks containing 50 c.c. plain bouillon. In both there developed pure growths of typhoid bacillus. This bacillus was agglutinated by typhoid serum. A few days later the patient's serum was found to agglutinate typhoid bacilli. The patient passed through a severe attack of typhoid fever, ending in recovery. She *did not desquamate.* The patient gave a history of measles and whooping-cough and exposure to scarlet fever when a child while an older sister was sick with that disease; but the mother does not think that she had any eruption.

In these two cases I have taken it for granted that there was not sufficient evidence in either one to warrant the diagnosis of scarlet fever. Yet, if we assume that mild cases of scarlet fever occasionally may not be followed by desquamation the claim that in both these instances it actually concerned scarlet fever associated with typhoid fever perhaps could not be disproven with absolute success. So long as it is not possible to place the diagnosis of scarlet fever upon an absolute etiological basis there always must be more or less room to question the real nature of scarlatiniform diseases, especially in patients not giving a clear history of previous attacks of typical scarlatina.




Case III.—Temperature Chart.

In neither of these cases was it possible to obtain any information of the use by the patients of any drugs that might have caused the misleading rashes.

Text-books in general mention the occasional presence of erythema in typhoid. Osler says: "It is not very uncommon in the first week of the disease to find a diffuse erythematous blush—E. typhosus. Formerly we thought it might be due to quinine."* Eichhorst† cautions against mistaking the diffuse typhoid erythema occasionally seen on the chest and abdomen, more rarely on the extremities, for scarlatina. This mistake

* Osler, fourth edition, 1902, p. 17.
† Handbuch, 1891, IV, 382.

he says is especially likely to occur when angina* is present. According to Curschmann,† Jenner (who mentions a case of typhoid fever mistaken for scarlet fever), Raymond, Le Maigre, and others, have described scarlatiniform eruptions in typhoid fever. These eruptions Curschmann is inclined to regard as medicamentous in nature.

But the most important statement that I know of concerning scarlatiniform and other anomalous rashes in typhoid fever is the aforementioned article by Da Costa. He points out that the scarlatiniform rash may remain throughout the fever, but this is rare; it may come out late, even in convalescence, and return in relapse; for the most part it is connected with angina. It passes away without desquamation. "Save under the exceptional circumstances of attending sore throat and desquamation there is no difficulty in determining the two diseases, or in diagnosticating that scarlet fever is not intercurrent in typhoid." Da Costa also discusses a more uncommon measles-like rash in typhoid fever, and details a case of the intercurrence of true measles in typhoid. Finally he mentions the combination and interchangeability of the scarlatiniform and the measles rashes in enteric fever.

The special point that I wish to emphasize again is that the practically constant presence of typhoid bacilli in the blood in the early stages, during the height, and at the beginning of relapses of typhoid fever, renders it possible by the use of proper cultural methods to settle promptly the diagnosis of typhoid fever in peculiar cases like those just reported. The indications are that this statement also holds true in paratyphoid fever.

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## TYPHOID FEVER IN INFANCY AND CHILDHOOD.‡

BY J. P. CROZER GRIFFITH, M.D.,
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THERE has been created in recent years a large literature in medical journals and text-books treating of typhoid fever in infancy and early life. Over my own signature there have appeared a few contributions on the subject, and I have but little new to add to these. It has seemed best to me, therefore, to make little, if any, direct reference to the contributions of individual writers, since this would consume far more time than the limited amount at my disposal, but, dwelling only on the peculiarities of the disease as seen in early life, to give only a synopsis of what is generally admitted by writers, combined with the results of my own experience, which has been somewhat extended.

*Etiology.*—The cause of typhoid fever in infancy and childhood is, of course, the same as in later years, *i.e.*, the action upon the system of a specific infectious germ. The usual method of entrance, too, is the same, viz., by the intestinal tract, in the case of infants and children particularly emphasized by the number of milk epidemics which have been reported. A number of cases are recorded, however, in which the disease was clearly contracted in fetal life. Writing in 1898 (*Philadelphia Medical Journal*, October 15), I found in medical literature 10 cases which could properly be called *fetal typhoid* in the sense that a typhoid mother gave birth to a fetus stillborn or dying shortly after birth, the typhoid bacilli being recognized by modern methods. Later Morse added cases from literature to the list. Including such of these instances of fetal typhoid as have been born alive although dying shortly afterward, as well as those which have shown symptoms of the disease very shortly after birth and have recovered, Dr. Ostheimer and myself, in a recent article (*American Journal of Medical Sciences*, November, 1902), have published 23 cases collected from medical literature which have been considered by the reporters to be suffering from typhoid fever, and which may be called *congenital typhoid* fever. Not all of these are undoubted instances of the disease. In fact, some of them are more than doubtful. But a considerable number are unquestionable. In all these instances of fetal or congenital typhoid fever it is evident that the bacillus was acquired not in the ordinary manner, but by the way of the placental circulation.

As regards the influence of age on the production of the disease as acquired in the ordinary method, there has been of recent years much dispute. It is curious to notice the change which appears gradually to be creeping over the sentiments of the profession in this country on this point. In 1892 a paper was read by Christopher, before the American Pediatric Society, upon typhoid in early life. In the course of discussion the expression was almost unanimous that the occurrence of the disease in infancy was extremely rare. In 1900 Blackader read another paper before the Society on the same subject. It was evident in the discussion at this time that the earlier belief was becoming much shaken. Last year the paper already referred to was presented by Ostheimer and myself. A still further wavering in the opinion of the members seemed evident.

My own belief, as expressed in the article referred to, is that the disease is far less rare in infancy and early childhood than has been generally supposed. With the greater care in observation, and especially by the aid of the serum reaction, it has become evident that the immunity of infants is not so great. Not that cases at this period are by any means as frequent as later in life, but that they occur far too often to allow us to call the affection absolutely rare. We have detailed 18 personal cases, observed by ourselves, or, in a few instances, by colleagues and not published previously, of typhoid fever in children up to the age of 2½ years. Including these with others published in medical literature, we have collected 139 cases occurring in the first year of life. Add-

* The occurrence now and then of angina in the beginning of typhoid fever suggests that the tonsils may be one port of entrance of typhoid bacilli into the blood.
† Loc. cit., p. 114.
‡ Read before the New York Academy of Medicine.

ing the congenital cases, we have in all 162 cases in the first year. As before stated, some of these cases are doubtless mistaken diagnoses and are open to question, but in the large majority of instances there appears to be no reason to doubt the diagnosis.

The principal cause of the relative immunity in earliest life I believe to be chiefly, if not solely, the lesser frequency with which typhoid bacilli enter the gastro-intestinal tract. The breast-fed children naturally are largely exempt, and the very common practice of subjecting the food to a degree of heat destructive of the bacillus, prevents the occurrence of the disease in artificially-fed children. Yet, when in any case it appears impossible to the family or to the physician that infection could have occurred, we must not forget the practice, not as common as it should be with proper precautions, of giving infants *water* to drink.

*Symptomatology.*—As compared with the symptomatology of the disease as seen in adult life the two chief characteristics of typhoid fever in infancy and childhood are (1) the less typical onset and course, and (2) the tendency of nervous symptoms to overbalance intestinal ones. It is particularly in the first two years of life that we are liable to be misled. I have seen more than one case in the first year proven to be typhoid fever, yet without any of the cardinal symptoms being present. In general we may say that in infancy the disease is liable to be atypical in most particulars; in early childhood and the first part of later childhood it shows the usual symptoms greatly modified; while in the latter part of later childhood, say, from the age of nine to that of twelve years, the symptoms approach much more nearly to those of adult life. The description which follows applies especially to the disease as occurring in early childhood.

We may review briefly some of the important symptoms. The *onset* is frequently slow and insidious, even more so than in adult life. My experience in the Out-Patient Department of the Children's Hospital shows me every year children brought for a number of visits, feeling very little ill and quite able to walk to the Dispensary. It might be only after repeated visits that the finding of rose spots or enlarged spleen, or the discovery of a Widal reaction, would settle the question of diagnosis. Then the child would be sent home and ordered to be kept in bed, not because it felt ill, but because the physician wished it. These walking cases of typhoid are, I believe, far more common than in adults.

On the other hand, it is certainly true that the onset of typhoid is at times remarkably sudden in children. The temperature may rise quite rapidly and the attack be well under way in only a few days, the initial symptoms being sometimes remarkably severe.

*Vomiting* is a comparatively common initial symptom in childhood. This, the experience of most observers, corresponds with my own. Rarely does it give any great trouble at any time in the course of the disease, but I can recall one case fatal apparently from uncontrollable vomiting coming on later in an attack which had, up to that time, been rather mild.

*Epistaxis* is probably not as frequent as in adults. This has certainly been my own experience at least. In one instance, however, in a girl eight or nine years old, I saw it followed by death. Some degree of *cough* is common, with the presence of coarse mucous râles in the chest. I have not often, however, found the cough troublesome, as it not infrequently is during the initial symptoms of typhoid fever in adults.

As regards the state of the *bowels*, the statistics of the cases collected by Ostheimer and myself show that diarrhea is a not infrequent symptom of the disease occurring in the first 2½ years of life. In the 417 cases in our report diarrhea is said to have been present in but 113, yet it was doubtless present, but not referred to, in others. The frequency in infancy must certainly be due to the tendency which the intestine shows in early life to exhibit diarrhea, dependent upon even slight congestive conditions. In early childhood the infrequency of diarrhea is probably to be attributed to the well-known fact that ulceration is far less marked, as a rule, at this period than later in life. Even in later childhood diarrhea has certainly been in my experience a symptom giving comparatively little trouble. Yet, I have occasionally seen cases where it was a most troublesome and debilitating symptom, and some published statistics show it to be perhaps as common as constipation. It is a curious fact that during the present winter season diarrhea has been unusually prevalent in the cases in the Children's Hospital of Philadelphia. This may be due to the fact that the great majority of our cases this year have occurred in children of from eight to twelve years of age. In the 71 cases occurring in the Children's Hospital in 1901, analyzed by Hand and Walker (*American Journal of Medical Sciences*, June, 1902), diarrhea occurred in 27.

*Abdominal Pain* is not infrequent, but great tympanitic distress is, in my experience, unusual. It is only rarely that it requires special treatment.

*Rose Spots* are probably present in the majority of cases. The frequency with which these are found will probably depend on the carefulness with which they are repeatedly sought for. I doubt whether there is much difference in the frequency of occurrence in children, as compared with that in adults. I have seen the spots so thickly covering the body, including the face, in a child of five that the disease suggested measles, and I have seen an equal development in an adult male. The same statement is true of the discovering of *enlargement of the spleen*. The organ is probably always enlarged. It could be detected in the great majority of my cases. Regarding the *desquamation*, on which stress has been laid by Weill and others, although it has been very often observed in my cases, I have not

been able to convince myself that it was in any way characteristic.

As already stated, the *nervous symptoms* of typhoid tend to preponderate over the intestinal in children. This expresses a relation only, and does not mean that they are actually very marked. On the contrary, the coma, subsultus, dry, brown tongue, muttering delirium and other symptoms of the advanced typhoid state seen so often in adults are much less often observed in childhood. Only in those children not many years removed from puberty are these severe symptoms apt to be found. I have quite recently seen a child of eight years in which there was profound unconsciousness, muttering delirium and very dry tongue, in fact, the typical symptoms of the advanced typhoid state; but this is the only case which now comes to my recollection. There is generally a certain slight degree of apathy which is quite characteristic. A slight delirium, especially at night, is common. Headache is a frequent initial symptom, but not to the degree seen in adults. One form of nervous disturbance appears more apt to occur than in later life, viz., an initial wild delirium which strongly suggests meningitis. I have for a time been misled entirely in diagnosis by such an occurrence. In fact, the occurrence of a pseudomeningitis I believe to be much more frequent than in adult life. I have now under my care just such a case, in a girl of five years. The patient developed an obstinate convulsive state on the third day of recognized symptoms, and then passed into an unconscious condition. Meningitis appeared the most probable diagnosis, and only the Widal reaction made the true nature of the disease manifest.

As regards *renal* symptoms there is probably no difference as compared with those of adult life.

As to the *duration* of the attack and the course of the disease in general, the total average duration may be stated as from fourteen to twenty-one days, although often a little longer, the attack being generally severer and more prolonged in proportion as the child is older. Of course there are exceptions, and fever may continue even for five or six weeks. The temperature usually rises rapidly, remaining high with very little variation between the morning and the evening elevation. It falls much more rapidly than in adults, the intermittent temperature of the last portion of adult typhoid being generally much less marked, greatly curtailed, or entirely absent. In some cases the fall is almost critical in type. In infancy the temperature is liable to be exceedingly irregular. Not infrequently in childhood there is a tendency for a moderately irregular elevation of temperature to persist for, it may be, weeks after all other symptoms have disappeared. This occurs also in adults, as is well known, and, I believe, with about the same frequency.

Regarding the *pathological anatomy*, the spleen is always enlarged, and the mesenteric glands are liable to be much swollen. This latter has been regarded by some writers as especially characteristic of the disease in childhood. The solitary and agminated glands exhibit a decidely hyperplastic condition, the glands becoming pinkish and projecting above the lumen of the intestines; but there is, as stated, as a rule, a very much lesser tendency to ulceration. When ulceration does occur, it tends to be superficial only. This applies especially to infancy and early childhood, but is open to exception. In later childhood the tendency to ulceration increases, and I have seen it very extensive even in children of from six to eight years. This is, however, exceptional. It is probably due to the presence of less marked intestinal lesions that the course of typhoid fever is shorter in childhood, and that the temperature falls more rapidly. It is an interesting fact that in none of the cases of typhoid fever in the fetus which I collected was there any involvement of the intestine whatever.

*Diagnosis.*—The diagnosis in infancy is difficult. The irregular character of the pyrexia of typhoid fever at this time of life, the tendency for any catarrhal state of the intestine to be attended by fever and diarrhea, and the fact, proven by autopsies, that inflammation of the intestinal glands may attend equally well typhoid fever and enterocolitis, make it at times impossible to come to a satisfactory conclusion. The value of the Widal serum reaction is inestimable at this period of life. In later infancy and early and later childhood the diagnosis still offers difficulties. Meningitis is to be carefully excluded. As time passes this difficulty is generally removed, since the early meningeal symptoms sometimes present rarely continue. Enterocolitis can usually be distinguished after a little time. Influenza offers peculiar difficulties. There is in it, as in typhoid fever, the continuation of pyrexia without discoverable cause sufficient to explain it. A leucocyte count helps to a great extent in many conditions, but not in distinguishing between these two diseases. The development finally of a serum reaction settles the question, if the finding of rose spots and an enlarged spleen has not done so already. We must not feel, however, that the failure of the serum reaction to show itself is proof that typhoid fever is absent. The reaction may be very late in arriving. For instance, in one undoubted case occurring in the Children's Hospital it was not obtained until the twenty-seventh day.

Of the *complications* and *sequels* I have only a few words to say, and these are especially to emphasize the absence of some of them. The various other infectious diseases may occur simultaneously with or consecutively to typhoid fever. I have seen this true of scarlet fever, of diphtheria and of measles. Aphasia is a sequel said to occur oftener after typhoid fever in childhood than in adult life. Personally I have seen little of it. Posttyphoidal insanity is a rare sequel. I have seen it in but two cases. Some very interesting examples are reported in medical litera-

ture. Noma is an unusual complication seen in childhood. I have observed it in several instances. Intestinal hemorrhage is generally considered to be marked by its infrequency. This is especially true of infancy and early childhood. I have, however, seen it in the case of a five-months'-old patient. In later childhood it is more common, although much less so than in adults. Still we have it occurring not so infrequently in our Children's Hospital cases. It was present in 4 of the 71 Children's Hospital cases of 1901. Generally it is very slight, but I have seen it exceedingly severe in two cases in the last two winters. Perforation, too, is generally admitted to be of great rarity in childhood. This is undoubtedly true, and I have been peculiarly unfortunate in meeting it in 4 cases, in children of eight, ten, eleven and twelve years, respectively. One of these cases was operated on; two others came to autopsy; in one the diagnosis was practically positive, although operation was refused and no autopsy possible.

*Relapse* would appear to be about as frequent as in adult life. It varies, of course, with the epidemic, and with the individual experience of the observer. It occurred in 6, *i.e.*, 8.5 per cent., of the 71 Children's Hospital cases referred to.

The *prognosis* is, on the whole, good in children. Of 137 cases occurring during ten years in the Children's Hospital up to 1898 only 3 died, a mortality of 2.9 per cent. Doubtless there were many other cases which recovered, although unrecognized, the true diagnosis of which more recent methods would have made plain. In the years 1898 to 1902, inclusive, there were 295 cases, and of these 20 died, a mortality of 6.7 per cent. The total mortality in 432 cases was 23, a death-rate of 5.32 per cent. The mortality of the 278 cases of 2½ years and less in which the result is stated contained in the collection of Ostheimer and myself, was unusually high, equaling 51 per cent. This would appear to indicate that the number of fatal cases is exceptionally high at this period of life. I am convinced, however, that the figures are to a considerable extent misleading, as the unusually severe and especially the fatal cases are the ones physicians are most liable to report. However, of our 18 personal cases of 2½ years and less, 5 died, a mortality of 27.77 per cent. The number observed is, of course, too small to allow of any conclusions being drawn. Nevertheless, it tends to make me change my former view, and to regard typhoid fever in infancy as a distinctly dangerous disease. This, however, needs further study. In early childhood the prognosis of the disease is certainly good.

*Treatment.*—In the present method of making hydrotherapy practically the only therapeutics of typhoid fever, except purely symptomatic treatment, the question is a vital one as to how far the method applies to the disease as occurring in children. Although valuable, hydrotherapy must be used with much caution, and the method of Brandt, carried out in its exactness, is seldom applicable. In my experience the true cool or cold bath occupies but little place at this time of life. Children, as a rule, do not tolerate it well. This is especially true of younger children. Even the tepid plunge of 85° to 90° F., or the graduated bath, is often not well borne, even by older children. I have repeatedly had to abandon it on account of the weakness of pulse which it produced. My custom is to employ sponging first, since this is often quite sufficient. If it is not, then the graduated bath of 90° cooled down to 80° F. is employed. In some instances I have had excellent results from the warm tub bath of 95° to 100° F. In many instances I have found the application of an abdominal ice-bag extremely serviceable in reducing temperature.

It is noteworthy that very often sponging seems to do harm. In many such cases tubbing is to be preferred to sponging on account not only of its greater power, but especially of its shorter duration. To sponge a child for fifteen minutes who is crying and struggling violently meanwhile is of very questionable good. A brief immersion in the bath is often far less fatiguing to the patient.

We must remember that children, as a rule, not only develop high temperatures readily, but that they tolerate this unusually well. We can, therefore, in many cases, afford to let the temperature alone. Careful judgment must be employed, and hydrotherapy can never be used in children as a necessary routine. Although so valuable in many cases, it is, without the exercise of judgment, often capable of doing far more harm than good.

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## NOURISHMENT, MEDICATION, HYDROTHERAPY, AND GENERAL MANAGEMENT OF TYPHOID FEVER CASES.

BY W. T. BAKER, M.D.,
OF MIDLOTHIAN, TEXAS.

The subject which I have selected is not by any means a new one, nor do I anticipate the giving to this enlightened body any new theories; but I wish to impress the importance of doing the things thoroughly well which we all know how to do and perhaps in a measure have done.

In the first place, according to our present knowledge, in typhoid fever we have a disease which is largely, if not entirely, a self-limited disease; one for which we have no specific medical or other antidote, or can by any other procedure limit the disease to a shorter period than three weeks, and in some cases longer. However, I do believe that, in a very large per cent. of our cases, we should limit the febrile course to three weeks or thereabouts—say, within twenty-five days. I shall not say that this or that thing is the *most important* to do for a typhoid fever patient; but rather that any and all things done should be most important, and if a thing is not important, why do it at all? Right here I wish to say, parenthetically, that there is a tendency upon the part

of the laity, if not the physician, to do unimportant things which many times are detrimental to our patients.

As I have indicated in the naming of my subject, there are four special divisions of it, which I shall mention in the order in which they are given in the subject heading, which begins with

*Nourishment.*—It is one thing to say what our patients shall eat, and another thing to get them to eat it. Then comes the all-important question of determining what they can eat with impunity and what is contra-indicated in an individual case. I have found that every case is individual in some respects, and should be treated as such. The old idea that typhoid fever patients should be fed on strained soups, buttermilk, malted milk, and such like is an erroneous idea and should be corrected. In the first place, they do not give a sufficient variety, are soon tired of, and are not very palatable; therefore, you cannot get the patient to take sufficient amount of these to get the desired amount of nourishment, and unless the patient will take the nourishment prescribed, it had as well not have been prescribed, so far as the results are concerned. Therefore, we must select something our patients can and will eat, and at the same time not be contra-indicated, and yet nourishing to our patient; for, as I stated at the first, it is *most important* that our patient should be kept well nourished. So I say to the nurse, feed the patient; give him buttermilk, most any kind of meat soups, plain or thickened with a little flour if desired; rice, oatmeal, wheatlet or any wheat preparation, XXX crackers, baker's bread in form of toast, with butter or softened with milk or hot water, or patient may eat it dry from the oven, chewing it up well and swallowing it with plenty of drinking water; a young chicken or a tender rabbit or bird made with soup, and cooked until very tender; most any kind of preserves or jelly, excluding the hard, lumpy portions, and things having seeds, such as blackberries; the syrup and the softer parts of canned fruits may be given, such as peaches or apricots; a baked apple; a well-ripe tomato, all but the skin and the hard core; an Irish potato that has been out of the ground long enough to be well dried out, and baked till it will mash up. All of these things which have been mentioned that require cooking, I recommend that they be thoroughly done before the patient should eat them, and, of course, should be seasoned according to taste. Now, from the things enumerated, you see I have a sufficient number to give a variety of nourishment; and from the whole some things can be selected which are to a certain degree palatable, or at least can be forced upon the stomach of most patients sufficient to accomplish a very good degree of nourishment; while, on the other hand, the absolute fluid diet soon tires the patient, and you fail to do the *most important* thing, viz., nourish your patient. I am aware that some may say that in my allowance of foodstuffs there is too much effete matter, that the bolus formed in the intestinal tract would do material harm to it as it passes through; but the facts in the case are (I think) to the contrary. As none of the articles I mentioned would become hard, dry masses in the intestinal tract, but would be soft, mush-like masses, which do not overdistend the bowels and do them harm, but to the contrary benefit them by wiping off the mucous membrane of the surface over which they pass, clearing off all discharges from the ulcerating patches, thus giving opportunity to get a local antiseptic or absorbent, or filling in effect of any drug which you may be administering, should you be fortunate enough to reach these ulcerating patches with such drugs. Also the frequent separation of one wall of the ulcerating gut from the other furnishes free drainage for the same, and these things prevent the ulcers from going so deep into the intestinal wall, as they no doubt would by laying one upon another, in doing this you often prevent hemorrhage; on the other hand, the gases which necessarily accumulate where such drainage has not been accomplished, will in many cases produce such distention of the bowels as to cause very serious and oftentimes fatal hemorrhage. So that, leaving out the question of palatability and nourishment altogether, I think, the effect on the bowels locally, from a mechanical point of view, is very much in favor of such things as will make an effete mass. When you come to the point of considering both nourishment and drainage, there can be no question as to the propriety and desirability of this plan of feeding. Then there is a humane side of this question: When patients are fed on liquid diet they become so emaciated that when the time does come for an appetite, some of them suffer inexpressible hunger, which cannot be satisfied, and their very bones and muscles cry out in pain for the needed nourishment; and should the patient get hold of something to eat his hunger is so great that he will not resist it, even though it be a thing that a well man ought not to eat. And then and there we have a relapse, which means a long and tedious spell for the patient and doctor, if not a funeral, whereas if the patient is well nourished all the way through, the fever period is shortened, the hunger is not so distressing nor uncontrollable. The patient gets right out of bed in a day or so after the fever is gone; takes the necessary exercise and fresh air and is soon well.

*Medication* is the second topic mentioned in my subject; and as I have disallowed of specifics in the outset, it will necessarily leave me to recommend the use of such drugs as will best meet the indications, as they appear from the time the patient is first seen. A large percentage of my patients need at first a good, thorough cleaning out; a stimulation of the secretions, and for this purpose I usually use the mild chloride of mercury with bicarbonate of soda, given in grain doses an hour apart until three or four are given, repeated the third or fourth night, as the indications may demand. I sometimes add podophyllin or rhubarb to this, especially if after

the first night I fail to get good results. If the fever is high and the patient is aching, as many of them do, I give them at first a prescription containing codeine, phenacetine, salol and quinine to last three or four days, to be given in daytime, continued through the night if the patient does not rest. In addition to this I give carbolic acid minims 1, tincture of iodine minims 2, and aqua drams 1, every four hours in daytime for its antiseptic effect, and this I continue throughout the fever period unless for some reason I need to give an absorbent, and then I give one that is also an antiseptic. I have used resor-bisnol with very happy results, or in case the carbolic acid and iodine are very distasteful to the patient, I use any other good antiseptic. When I have given enough quinine to be sure I have overcome all malaria and the pain has subsided so I can leave off the codeine and phenacetine, I continue the salol by giving about six grains, three times a day, together with bicarbonate of soda and about one-eighth grain of the mild chloride of mercury; this makes up my routine of dosage throughout the fever period with the addition of strychnine to the liquid solution, as soon as indicated by the pulse; thus you see, I have a capsule and a teaspoonful of the antiseptic solution every four hours in daytime. That is all the medicine my patient has to take, unless a dose to relieve pain, quiet nervousness, to produce sleep, or meet any such conditions which might arise and, of course, when I begin the use of strychnine, I arrange my antiseptic solution in dosage and time to suit it. Before leaving the subject of medication, I wish to say that I have read with interest some very favorable reports from the use of acetozone as an intestinal antiseptic in typhoid fever, as well as other intestinal troubles; but as yet have not tried it myself. However, I recommend a careful study of the reports of this new antiseptic and its adoption as soon as its virtues are proven superior to those now in use. I also have a hope that the serum treatment may prove a great success. I go into the details of my medication chiefly to show its simplicity and conservatism. I do not give drugs except to accomplish certain ends; and believe many times in an effort to cure the patient, very many doses and drugs are given which do the patient actual harm.

*Hydrotherapy.*—This is a most important part of the treatment, and I use it in all the ways with which I am acquainted, to accomplish the purposes for which it is indicated. Some of which are to quench the thirst, furnish water to the fever-dried tissues, to keep the temperature from reaching and remaining at a harmful height, thus preventing nervousness and delirium, and sustaining the heart, for all of which I prefer the water cold. I sponge them, plunge them, and pack them; usually preferring the latter; am not much in sympathy with the plan of pouring ice water over the head, to the neglect of the other portions of the body.

*General Management.*—This is the last theme mentioned in my subject, yet it is a very important part of the treatment. Much could be written upon this subject, but I shall endeavor to be as brief as possible to give you such ideas as I have in mind. First, if possible, I want a nurse that is strong enough in body and mind to carry out my instructions, one who does not *know all about nursing sick folks.* I want my patient fed at regular intervals, say about every two and a half to four hours in daytime and as often at night, if awake, but do not want them awakened to give nourishment as long as they are reasonably strong. I want the nurse to sleep in the room with the patient, but not to sit up with him as long as he is rational; and it is not necessary to sit up and give medicine or control fever. I want business matters and other things that are liable to worry kept away from him; do not want all the kin, the neighbors, their children and their dogs to call on him or stay about the place; want his bedding changed, in mild cases, every second day, or, if fever is very high, every twenty-four hours. The urine, effete matter and what he spits or vomits should be disinfected and removed from the room at once; the room kept well ventilated and cleaned, with plenty of light; quiet maintained day and night. The patient should know enough of the current happenings of the outside world to give him something to think of and keep him from being too lonesome or from thinking too much of business or other matters.

Now, in conclusion, I wish to say I have written as for the average case and patient which I vary according to the severity of case, and general surroundings. The dosage is for the average adult, children in proportion. Herewith I wish to give you a tabulated report of thirty-one cases treated after the plan outlined, which, I think, strengthens very materially the points which I have endeavored to make, and these cases are just as they came to me in my general practice.

From this report you will notice I have only had one case of hemorrhage; and it was a case where the patient had been treated for two weeks by a druggist with purgative pills and quinine. The patient had not remained in bed until after the hemorrhage, when I was sent for, which was five days before he died. You will also observe that there are only two deaths, one of these the case just mentioned; the other a case of reinfection, a girl, in which there were other complications, accounted for by her time of life. There were only two cases of reinfection, one of which, after having fever fifty-two days, got out of her bed, put on her clothes and walked across the floor through a hall and sat down at the top of a flight of stairs to talk; all of which she did without the aid of any one; this being the last day of fever; and the fourth day after the fever was gone, she went down stairs for her meals at her boarding house, and continued to do so thereafter. And before another month had elapsed she was in her place as teacher in one of the public schools of Dallas, where she has continued to teach until this time. Another one of my patients

was a young lady, eighteen years old, whose fever stopped on the twenty-first day; the third day after the fever left her she walked a distance of four blocks to where a new flour mill was being built, and in company with two other girls went into the basement and up a flight of skeleton stairs to the top of the fourth floor, and back again to town and back home, making in all an absence of about an hour, after which she said she was not very tired, and from which exercise there were no apparent bad effects. I did not know of this trip until after it was made, nor did I approve of it.

I make particular mention of these two cases to show how well the strength may be maintained by proper nourishment, even though they have high fevers and long fever periods. The young lady who took such a risk by going to the mill and to town, had a temperature running up to 104.5° F. for several days, though the most of the time 103° F. would represent the highest temperature; and the temperature of the other lady, specially mentioned in regard to her strength, reached 106° F. the second and third days after her relapse, which occurred on the twentieth day of her fever.

REPORT OF CASES.

| Name | Sex | Age | Month | Called | Duration | Remarks |
|---|---|---|---|---|---|---|
| V. K. | Male | 19 | May | 5 | 33 days | Complicated by hyperemic spleen |
| J. B. | male | 26 | June | 4 | 28 days | |
| W. L. H. | male | 6 | June | 5 | 21 days | |
| C. V. | male | 38 | June | 4 | 23 days | |
| * * | female | 7 | June | 3 | 21 days | |
| J. C. Mc. | male | 49 | July | 1 | 21 days | |
| Mrs. W. | female | 37 | July | 4 | 25 days | |
| W. W. | female | 15 | July | 4 | 35 days | Complicated by malaria |
| C. C. | female | 14 | July | 1 | 32 days | Died |
| N. B. | female | 18 | August | 3 | 21 days | Walk to new mill, etc. |
| B. | female | 14 | August | 1 | 20 days | |
| Jim C. | male | 28 | August | 6 | 21 days | |
| H. D. | male | 8 | August | 2 | 22 days | |
| C. H. | male | 8 | August | 4 | 21 days | |
| C. H. | male | 6 | August | 4 | 21 days | |
| J. M. L. | female | 7 | August | 6 | 22 days | |
| C. B. | male | 11 | August | 1 | 18 days | |
| C. B. | female | 9 | August | 1 | 20 days | In school in one week |
| B. A. | female | 8 | September | 4 | 23 days | |
| Miss C. G. | female | 24 | September | 3 | 52 days | Reinfected on the twentieth day, temperature reaching 106°F. for two days; walked to stairs day fever broke; in four days went to meals from stairs. |
| B. | female | 12 | September | 1 | 23 days | |
| B. | female | 10 | September | 1 | 21 days | |
| M. M. | female | 16 | September | 5 | 22 days | |
| C. W. S. | male | 40 | September | 7 | 23 days | |
| J. H. | male | 31 | September | 7 | 21 days | |
| B. | male | 6 | October | 1 | 28 days | |
| J. T. M. | male | 11 | October | 2 | 35 days | |
| C. C. | male | 20 | November | 7 | 23 days | |
| M. B. | female | 12 | November | 6 | 24 days | |
| W. G. | male | 31 | December | 2 | 22 days | Very sick |
| Chas. L. | male | 33 | December | 15 | 20 days | Died, result of hemorrhage |

I trust I have not worried anyone by the statement of the details of my cases and their treatment. But on the other hand that I have impressed your minds with the necessity of liberal nourishment, restricted medication, abundant use of water, and strict carefulness in the general management of this kind of cases. I have never had a relapse or any discoverable discomfort from my feeding; on the other hand, when I have been unable to feed my patients as I desired I have observed a longer term of convalescence, and usually a lengthening of the fever period.

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## THE ETIOLOGY AND CHEMICAL PATHOLOGY OF GALL-STONES.

BY C. A. HERTER, M.D.,
OF NEW YORK.

(Continued from Page 536.)

*Biliary Infection in Cholelithiasis.*—The presence of bacteria in the bile of cholelithiasis patients is a very common but by no means regular occurrence. W. Peterson* in fifty operations for gall-stones found bacteria in the bile 44 times. In 36 instances the *Bacillus coli* was found, 6 times this bacillus was associated with the *Staphylococcus aureus*, and in 4 cases the *Streptococcus pyogenes* was the companion of the *Bacillus coli*.

These figures are probably fairly representative of the cases of cholelithiasis that call for operative interference, although no typhoidal infections happen to occur in Peterson's group of cases. It should be remembered, however, that the character of the gall-bladder infection does not necessarily represent the infective agent concerned with the production of the gall-stone, for it may happen that a stone referable to typhoid infection is the means of provoking a cholecystitis due to another organism, long after the original inflammation of the gall-bladder has subsided. Sometimes the bile is sterile, although stones taken from the same bladder contain living bacteria. On the other hand a stone from which no organisms can be cultivated is sometimes associated with bile from which bacteria can be grown.

*Influence of Human Biliary Stagnation.*—It has already been mentioned that an essential condition for the production of experimental cholelithiasis is some degree of impairment of the expulsive power of the gall-bladder. In the absence of such impairment it appears to be extremely difficult for bacteria to gain and maintain a foothold in the healthy gall-bladder. Myake found that ligation of the cystic duct does not lead to infection of the cystic bile, presumably because the unchecked bile flow into the intestine suffices to wash back entering bacteria and to limit their spread.† On the other hand ligation of the ductus choledochus was followed by infection of the cystic bile, because this operation which lies within the normal bacterial zone,‡ completely stops the bile stream to the duodenum. The results of Ehret and Stolz differ from those of Myake in regard to the consequences of ligation of the cystic duct. These ob-

*Brun's Beiträge, Bd. 23.

†Atrophy of the bladder from ligation of the cystic artery is a result of this operation.

‡According to Netter and Duclaux, in dogs and rabbits only the lower part of the ductus choledochus (near the papilla) is ordinarily inhabited by bacteria.

servers found that even after the cystic duct had been severed between two ligatures there was a pronounced increase in the number of organisms present in the bile.* As these organisms could not have come from the intestine it is necessary to assume that they arose from the multiplication of bacteria already present in the gall-bladder or possibly that they came from the blood. The eventual death of these organisms appears referable to their feeble powers of adaptation rather than to any increase of the bactericidal action of the bile.

Thus, it is likely that while the mere stagnation of the cystic bile may not always be followed by infection of the gall-bladder, such stagnation greatly increases the chance that bacteria will establish themselves in this locality. The information derived from experimentation upon animals makes it extremely probable that whatever causes cystic stagnation in man, increases the opportunity for infection and consequently of cholelithiasis. Among the conditions that lead to impaired expulsion of the cystic bile are the atrophy of the muscular coat of the gall-bladder and various mechanical agencies which obstruct the biliary passages. The increased liability to gall-stone in old age probably depends in a measure on the weakening of the muscular coat of the gall-bladder, but a diminished resistance of the body fluids to infectious agents is possibly another factor. The greater incidence of gall-stones in women has been attributed to the mechanical hindrance to the expulsion of bile from the gall-bladder caused by tight lacing. Probably tight lacing acts as such a hindrance, but it fails to explain the liability of the women who do not lace.

It is stated that in fever the gall-bladder is emptied with less completeness than in health, but the evidence in favor of this view is not satisfactory. That the gall-bladder is distended with excessively watery bile in many cases of typhoid fever is well known to pathologists, and it is highly probable that this overdistention is connected with a paretic state of the muscular layer. But it is much more likely that this is a result rather than a cause of infection. Whether fever is in itself a cause of muscular relaxation must be regarded as an open question.

It may therefore be said that while experimental evidence makes it highly probable that hindrance to the normal bile-flow from the gall-bladder facilitates infection of the human gall-bladder, our knowledge of the disturbances of cystic function that cause biliary stones is still incomplete.

*Mode of Action of Bacteria.*—There are two ways in which we may conceive gall-bladder infection to operate in the production of gall-stones, first by setting up cholecystitis, secondly by causing a decomposition of the bile. Although these processes are probably connected closely, we must consider them individually.

*It will be recalled that these investigators found bacteria much oftener in the bile of normal animals than have other writers.

*Cholecystitis and Its Effects.*—One of the consequences of a slight or moderate catarrhal cholecystitis is the proliferation, desquamation and degeneration of epithelial cells. These cells contain cholesterin, a part of which ultimately finds its way into the bile. Probably the quantity of cholesterin increases as time passes, owing to degenerative changes in the cells, the nature of which is obscure. It is well known that pus contains considerable cholesterin and that crystals of cholesterin are more apt to occur in old than in fresh pus. The cause of the increased production is not understood but is to be sought either in cleavages induced by bacteria or in ontolytic decompositions. The same may be said of the cholesterin of epithelial origin. The desquamated epithelium contains some calcium, but whether the calcium of gall-stones has this origin or is derived from mucus, is not clear. A careful study of the influence of cholecystitis on the calcium of the bile is a desideratum.

It is noteworthy that in their observations on purulent cholecystitis Ehret and Stolz were unable to find any indications of the presence of cholesterin in the contents of the gall-bladder.

*Decomposition of the Bile.*—In the course of any infection leading to cholecystitis the bile is liable to undergo decomposition. This is very plainly seen in typhoid fever, in the course of which a large part of the bilirubin is apt to be destroyed. The nature of the decomposition products is unknown and its study would surely lead to results of considerable interest. In purulent cholecystitis, also, the bilirubin disappears, often very rapidly, so that all traces of color may be lost in two or three days. Even in milder types of inflammation, such as commonly lead to cholelithiasis there is often a decomposition of the bile, the nature of the cleavage products being, however, but imperfectly understood. The presence of bilifuscin and bilicyrin in some gall-stones is probably to be regarded as an indication of decomposition of the biliary pigments. It is believed that the bile acids also undergo decomposition at times, with liberation of cholalic acid.

Whether these decompositions are the immediate result of the growth of bacteria in the bile or an indirect effect of altered secretory conditions of the inflamed mucosa is uncertain, but the former origin appears not improbable. Considerable alterations in the composition of the bile may be induced experimentally by modifying normal metabolic processes, but there is as yet no satisfactory evidence that cleavage products arise in this manner.

The decomposition of the bile, which is referable directly or more remotely to the activity of bacteria, may be presumed to alter profoundly the conditions upon which the presence of certain constituents (cholesterin, lime salts) of gall-stones largely depends and may thus have important bearings upon the problem of precipitation. A scientific discussion of this influence is at present not possible.

*Influence of Reaction.*—The opinion has already been expressed that variations in the reaction of the bile do not ordinarily play a leading rôle in determining the precipitation of the constituents of gall-stones but some further discussion of this point will not be amiss.

Very carefully conducted experiments made by Dr. E. K. Dunham* on the influence of the growth of the typhoid organism and the *Bacillus coli* on diluted sterile human bile indicated that even a considerable growth of these organisms after many days occasions only the slightest change in reaction, in the direction of acidity. It is possible that more pronounced acid production would be observed if the period of growth of these organisms had been retarded.†

It has been stated that the presence of free alkali in the bile is favorable to the separation of bilirubincalcium. We do not know, however, that an alkaline reaction is essential to this separation. An acid reaction would probably be inconsistent with the precipitation of bilirubincalcium.

Whether the production of alkali (ammonia acids) by the bacteria concerned in the establishment of cholecystitis is really a factor in the precipitation of bilirubincalcium is still uncertain.

From what has been said it appears conceivable that alterations in the reaction of the bile should exert some influence upon the precipitation of cholesterin and bilirubincalcium and that changes from an acid to an alkaline reaction or the reverse should have some significance for the stratification so often observed in gall-stones. Nevertheless the variations of cholelithiasis biles from the normal reactions are probably only very slight and the idea that the constituents of gall-stones are precipitated in consequence of alterations in reaction cannot be said to rest on a firm basis.

*Effect of Concentration.*—Mere concentration of canine and human bile appears to have very little influence upon the separation of bilirubincalcium, so long as bacterial decomposition is excluded. Bilirubin may, however, separate if the concentration be considerable. Mr. Rettger's experiments indicate that dog's bile is not usually saturated with cholesterin and that some concentration of the bile is possible without occasioning precipitation. The fact that the bile salts are concentrated *pari passu* with the concentration in cholesterin may help to explain the absence of cholesterin separation even after considerable concentration of the bile. Apparently the chief effect of mere concentration of the bile is to increase the liability to separation of bilirubin, but the question has not been fully worked out.

*Presence of Proteids.*—Steinmann found that egg albumin is capable of throwing calcium carbonate out of solution of calcium salts, and Naunyn showed that this mixture of proteids throws bilirubincalcium out of solution under certain conditions. Nannyn expresses the opinion that proteid substances may play a considerable rôle in determining bilirubincalcium separation from the human bile and thus have much to do with the formation of concretions. During cholecystitis various proteids make their escape from the epithelial cells of the gall-bladder into the bile, but we are still in ignorance as to the part they actually play in the production of calculi.*

*Presence of Foreign Bodies.*—Reference has already been made to the comparatively small influence of foreign bodies in causing cholelithiasis. It sometimes happens that the human gall-bladder contains a piece of silk ligature or a bit of metallic nature which has become incrusted with calcium salts. That the action of micro-organisms is not essential to such incrustation is evident from the experiment of Myake, in which a

*Note by Dr. Dunham.*—Experiments to determine changes in reaction of nutrient media containing bile were made as follows: Human bile was mixed with five times its volume of distilled water containing 1 per cent. of Witte's pepton and one-half per cent. of table salt, and the mixture filtered. In one experiment, this filtrate was placed in fermentation tubes and sterilized, by the intermittent method, in an Arnold Sterilizer. In another experiment the sterilization was accomplished by filtration through a Berkefeld filter. The fermentation tubes were inoculated with the colon bacillus or typhoid bacillus and kept in the incubator at 37° for from seven to ten days; blank tubes being kept under the same conditions as controls. After these intervals cultures were made from the fermentation tubes and then their contents titrated with a tenth-normal hydrate solution. In all cases the control tubes were sterile, and the other tubes were shown to contain pure cultures of the bacteria with which they had been inoculated. The appearance of the media in the fermentation tubes and in shake-gelatine cultures from them showed that a moderately abundant growth had taken place in the inoculated fermentation tubes.

Five cubic centimeters of the media in the fermentation tubes were diluted with distilled water to 200 c.c., and this diluted solution, which had a light green color, was titrated, phenolphthalein being used as an indicator. The amount of decinormal sodium hydrate solution required to effect a distinct, though faint, change of color in the diluted medium was noted, and then the standard alkaline solution added until a drop no longer caused a change of color at the point of introduction. There were no marked differences discovered between the reactions of the media in the control tubes and those in which a growth of the colon bacillus or the typhoid bacillus had extended over a period of seven to ten days. The differences noted were not greater than 0.1 c.c. of the decinormal alkali. Such a difference might be due to variations in the amount of evaporation in the different fermentation tubes or to errors in titration owing to the green color of the solution: It appears certain that no alkali is produced, and that, if there is any increase in the acidity of the media, it is very slight.

†*Note.*—Cholesterin is less soluble in an acid than in a neutral or alkaline bile and it is conceivable that even slight changes in the reaction of the bile may influence the separation of cholesterin crystals from a supersaturated solution. When cholesterin has once begun to be deposited about the nucleus of a future gall-stone it is not difficult to understand why the process continues, until cholesterin is no longer produced in such excess, through the desquamation of cells, that it suffices to keep the bile supersaturated. The real problem is to explain the first crystalline deposit of cholesterin.

It is well known that small masses of altered epithelium and bacteria are commonly found in the centers of cholesterin stones and it occurs to one that this fact may perhaps be related to the production of acid by the bacteria which often cluster so abundantly about epithelial remains. The multiplication of these organisms with the production of acid might perhaps determine the precipitation of cholesterin at the limited surfaces where the acid is liberated and where owing to the slowness of diffusion the ions might be presumed to exist in greater concentration than elsewhere in the bile. The process of crystalline deposition once begun the maintenance of an acid reaction at the point of deposit would hardly remain a necessity for further accretion to the young calculus, since according to a well recognized physical law crystalline deposits readily occur where similar crystals already exist.

In the alkaline fermentation of the urine we have a condition which furnishes us with a legitimate analogy. Here, as is well known, we often find deposits of crystalline phosphates in the mucus. But it is in the mucus that the alkali-forming bacteria are growing most energetically, and it cannot be doubted that the early deposition of crystals in the mucus (before their appearance elsewhere and before the entire volume of the urine is distinctly alkaline) depends on the focal liberation of diffusible alkali.

Whether cholesterin is ever precipitated in crystalline form when the bile reacts alkaline to phenolphthalein is at present unknown.

*Normal canine bile is capable of dissolving considerable quantities of Merck's mucin prepared from bile. May not an increase in the mucin of the human bile have some influence on the separation of bilirubincalcium?

silk thread was incrusted with lime salts, although the bile was sterile. Neither bilirubin nor cholesterin could be detected in the incrustation. At the present time there is no evidence that either cholesterin or bilirubincalcium ever separates merely because of the presence of a sterile foreign body in the gall-bladder. On the other hand there is much reason to believe that certain foreign bodies, such as masses of bacteria, and masses of epithelial cells, may act as the nidus for a gall-stone in the presence of a bacterial cholecystitis.

*Influence of Agglutination.*—Harvey Cushing* has called attention to the fact that in typhoid fever there may be an active agglutinative serum reaction toward both *Bacillus typhosus* and the colon bacillus isolated from the gall-bladder. The bile may share the agglutinative properties of the serum. Richardson† has examined at autopsy the bile of fatal cases of typhoid fever and found large clumps of bacilli in five out of six cases. It is possible that bacilli agglutinated in large clumps by agglutinations present in the bile are more likely to form the nidus for stone formation than individual unclumped bacilli or smaller clumps of bacilli, but definite information on this point is lacking. It is also uncertain whether a large clump of living bacteria offer a better starting point for the production of a gall-stone than an epithelial fragment or cell of equal size. The possibility already mentioned, that living bacteria may influence by their products the reaction of the bile, especially at the seat of their production, and thus facilitate the separation of cholesterin or of bilirubincalcium is perhaps worthy of receiving serious consideration in connection with the phenomena of agglutination.‡

*Time Required for Gall-stone Formation.*—Until within very recent years there was no information as to the time required for the production of a human gall-stone. This arose from three circumstances. First, gall-stones may lie for an indefinite period in the gall-bladder without causing symptoms. Hence ordinary clinical observation could not furnish the needed light. Secondly, the size, number, consistence and chemical characters of gall-stones afford no certain data as to their age. Lastly, no one had succeeded in experimentally inducing true gall-stone production. The work of Gilbert and Mignot, already described, has shown that under suitable conditions true gall-stones may be experimentally induced in the course of three to six months. We cannot without further information assume that the same period suffices for the production of human stones, but these experimental results are strongly suggestive of the possibility of rapid calculus production in man. An observation made by Hansemann makes it probable that a human gall-stone may attain a moderate size in the course of seven months.* The case in question is not quite conclusive, because although the stone was an ordinary mixed cholesterin and bilirubincalcium calculus, it probably had an extracystic origin in the duodenum of a patient who had undergone a gastro-enterostomy. The absence of an acid gastric juice was apparently an important element in permitting the production of the stone. Homans† has reported an instance in which stone-formation recurred in not more than one year and eight months and Kelve‡ records a case in which the period of reformation was probably less than a year and a half.

Although positive evidence is still wanting we are justified in regarding it as probable that gall-stones may form in the human gall-bladder in the course of three or four months, when the conditions are especially favorable. Hence, when an early operation for cholelithiasis is undertaken the possibility of an early recurrence cannot be left out of mind, as the gall-bladder is liable to be left in an infected state.

*Paths by which the Bacteria Enter the Gall-bladder.*—There are three paths by which microorganisms may gain access to the liver and through the liver to the contents of the gall-bladder: (1) From bacterial foci which discharge into the general circulation; (2) by the passage of bacteria into the common bile duct from the duodenum; (3) by the passage of bacteria from the intestine into the portal circulation. The first path is probably frequently followed by the bacteria that set up the cholecystitis which is responsible for making calculi. The second path at first sight seems the most important and natural one for cystic infection. Yet we do not know under precisely what conditions infection follows this route. In health the duodenum contains few bacteria and these are not of the varieties responsible for the cholecystitis that lead to cholelithiasis. In gastroduodenitis and duodenitis streptococci are sometimes abundant in the duodenum and may perhaps find their way to the gall-bladder. Possibly also in the course of other digestive disturbances colon bacilli find their way along the biliary ducts to the gall-bladder.

There is some reason to believe that the most frequent route for infective agents is the portal circulation. This view has been especially emphasized by Dr. Lartigau,§ of New York, who induced inflammation of the intestine of dogs by means of corrosive sublimate and other irritants. The animals thus prepared were fed (patho-

*Typhoidal Cholecystitis and Cholelithiasis. Report of a Case without Previous History of Typhoid Fever, and Discussion of a Possible Agglutinative Reaction in the Bile and its Relation to Stone Formation. Bulletin of the Johns Hopkins Hospital, Vol. IX, No. 86, May, 1898.

†On the Role of Bacteria in the Formation of Gall-stones. The Journal of the Boston Society of the Medical Sciences, Vol. III, p. 79, Jan., 1899.

‡The agglutinative properties of the bile have been recently investigated by Arnold Cantani, Jr. He finds that the bile of animals immunized against typhoid, colon or influenza bacilli possess a considerable agglutinative activity for these organisms. This activity is, however, distinctly less marked than that possessed by the blood serum. (Ueber die agglutinirenden Eigenschaften der Galle. Centralblatt für Bakteriologie, etc., Erste Abtheilung, Bd., XXXIII, No. 9, p. 731, 1903.)

*Ein Beitrag zur Entstehung der Gallensteine, Virchow's Archiv, Bd. 154, Heft 2, p. 380, 1898.

†Annals of Surgery, p. 115, 1897.

‡Die chirurgische Behandlung der Gallensteinkrankheiten, Berlin, 1886.

§New York Academy of Medicine, Dec., 1902.

genic) bacteria which were soon found in the bile. In some instances the cystic duct, in others the common duct, was ligated previous to the feeding with bacteria. Hence infection must have occurred through the intestinal mucous membrane, doubtless at the point of injury.

Dissenting voices have been raised against the doctrine that biliary infection occurs through the portal vein. Thus in a recent paper Carmichael* states that he injected, in separate experiments, typhoid bacilli, *Bacillus coli communis* and *Streptococci* into the portal circulation of rabbits without being able to recover bacteria from the bile. He considers that these experiments not only support the view that the liver destroys the micro-organisms that reach it but render improbable the occurrence of biliary infection by way of the intestine and portal circulation. If, however, we take into consideration the positive results obtained by Blachstein,† Fütterer‡ and others there can remain no doubt that the intravenous injection of *Bacillus typhosus* and *Bacillus coli communis* is very often followed by the appearance of the injected organisms in the bile. It is true that in these experiments the bacteria were put into the systemic circulation and may have reached the gall-bladder through the cystic artery, without having first traversed the liver, but this appears unlikely. Dr. Welch§ states his belief that Blachstein's inoculations were very often followed by negative results as regards infection of the bile. These negative results are probably referable mainly to the bactericidal powers of the liver cells. The negative results obtained by Carmichael cannot therefore be taken as proof that biliary infection does not arise by way of the portal circulation. A consideration of the evidence at present available makes it extremely probable that the bile may be infected by way of the portal system, despite the bactericidal action of the liver cells. This is true not only of experimental infections in animals, but also of human biliary infection with the organisms of typhoid fever, and the *Bacillus coli communis*. How often infection of the bile arises in consequence of ulcerative lesions in the intestinal tract is not yet clear, but it is certain that such lesions must greatly influence the liability to biliary infection. As yet, however, it is impossible to say with certainty whether the portal system or the direct duodenal path is the more frequent route of biliary infection in man.

*Do Gall-stones Originate Independently of Infection of the Bile Passages?*—The facts that have been reviewed clearly show that through the local action of bacteria upon the walls of the gall-bladder (or bile passages) there may be created all the conditions essential for the production of gall-stones. The experimental formation of real calculi makes it safe to conclude that derangements in general metabolism are not essential factors in the process of production. This is, however, no evidence that disturbances of metabolism which modify the composition of the bile, may not under certain conditions play an important part in bringing on cholelithiasis. There are many French and English writers who hold that constitutional states attended with metabolic disorders are a common cause of gall-stone formation. It is worth while to examine the foundation on which this view rests.

*Constitutional Influences Modifying the Composition of the Bile.*—It is surprising to find how little satisfactory information exists as to the influence of different kinds of dietaries on the composition of the bile. Paton and Balfour* found through observations on a woman with a biliary fistula that the amount of solids in the bile rose with the amount of nitrogen excreted by the urine. Brockbank† looks on these observations as evidence that more bile salts are produced from a nitrogenous diet than from one poor in nitrogen. Admitting this inference to be sound one would be led to the conclusion that persons on a diet rich in nitrogen make bile capable of holding in solution more cholesterin than persons who live on meager nitrogenous rations. Whether there is actually a greater liability to gall-stones among those who consume little nitrogen is not conclusively shown by any statistics bearing on this point. I cannot believe that variations in the percentage of bile salts are of great importance in determining the incidence of cholelithiasis, for the reason that the great factor in the formation of cholesterin containing stones is the local condition of the gall-bladder. In other words a cholecystitis leads to the local presence of so much cholesterin that the quantity of bile salts in the bile cannot greatly influence the ultimate deposition of cholesterin.‡ There is no reason to think that the percentage of bile-salts in the bile exerts an influence on other biliary constituents than cholesterin.

Whether an increase in the cholesterin of the blood, from constitutional causes, ever markedly modifies the amount of cholesterin in the bile is a question that cannot now be answered. Fischer reports a case of diabetes with lipemia and cholesteremia in which the blood held at least 0.478 per cent. of cholesterin, a quantity greatly above the normal average.§ The observation is of interest as indicating the possibility of a marked cholesteremia in a constitutional disease, but there is no certainty that even so great an excess of cholesterin in the blood leads to a significant excess in the cystic bile.

Further studies of the relationship between the

*The effect of injection of micro-organisms into the portal system, on the sterility of the bile in the gall-bladder. The Journal of Pathology and Bacteriology, Vol. VIII, No. 3, Sept., 1902, p. 276.

†Intravenous inoculation of rabbits with the *Bacillus coli communis* and the *Bacillus typhi abdominalis*. Johns Hopkins Hospital Bulletin, Vol. II, p. 121, 1891.

‡Wie bald gelangen Bacterien, welche in die Portalvene eingedrungen sind, in den grossen Kreislauf, and wann beginnt die Ausscheidung durch die Leber und die Nieren? Berl. klin. Woch., Bd. XXXVI, S. 58, Jan. 16, 1899.

§In a footnote to Blachstein's paper.

*Laboratory Reports, Royal Coll. Phys., Edinburgh, 1891.

‡On Gall-stones and Cholelithiasis, 1896, pp. 27 and 83.

‡Ueber Lipämie und Cholesterämie, so wie über Veränderungen des Pankreas und der Leber bei Diabetes mellitus. Virchow's Archiv, Bd. 172, Heft 1, p. 47, 1903.

§Hoppe-Seyler found from 0.02 to 0.06 per cent. of cholesterin in the plasma and serum.

cholesterin of the blood and of the bile are much to be desired.*

*Influence of Excessive Feeding of Fat.*—Gall-stones sometimes contain a considerable percentage of fat, which may be present chiefly as a compound of stearic acid.† As the origin of this acid is obscure it was determined to make some observations with a view to learning whether the ingestion of large quantities of fat has any influence on the fat content of the bile, as has been stated by Naunyn. These observations had an unexpected outcome.

Two dogs were fed on boiled beef fat and an extremely small amount of boiled meat. During twelve weeks one dog (weighing about 32 pounds) was induced to eat from one-half to one pound of fat daily. During the last two weeks of the experiment he received potatoes mixed with fat. At autopsy the subcutaneous and omental fat was found to be extremely abundant. The liver was very markedly fatty. The bile was normal in quantity, color, consistence and reaction (faintly alkaline to litmus) but contained an abundant sediment of dark brown particles about the size of large grains of sand. These little masses were found to consist of pigmented, highly refractive hyaline material mixed with the débris of degenerating epithelial cells, portions of which were stained readily by osmic acid. No cholesterin could be detected in these particles; certainly none was present in crystalline form.‡

A second dog (about 19 pounds) was fed for nine weeks in the manner just described. For 3 weeks he consumed nearly one-half pound of fat per day. Then for a week he refused to eat. During the last two weeks of the experiment the fat was mixed with potato and was voraciously eaten. The gall-bladder contained a little bile of normal consistence, color and reaction (slightly alkaline). Affixed to the base of the gall-bladder was a small, black spherical concretion (about 4 mm. in diameter), of somewhat firm consistence. Near it lay numerous small detached irregularly shaped black masses of apparently the same material. Microscopical examination showed the concretion and the separate masses to consist of deeply pigmented, highly refractive hyaline material. No crystals of cholesterin were detected. The mucosa near the adherent body was considerably thickened and presented numerous small translucent miliary projections.§ The mucosa for a short distance about the adherent body was covered by a gelatinous layer of great transparency from 1 to 2 mm. in thickness, apparently consisting of mucinous material.*

Sections made through the gall-bladder and the attached intracystic body showed the "concretion" to be made of a group of glands greatly dilated by what is probably an accumulation of partially transformed mucus, grown firm from inspissation. A fuller description of this body will be given when the results of other fat feeding experiments are described.

These observations are of some interest on account of their suggestiveness. I have examined the gall-bladders of a large number of meat-fed dogs without having ever observed a sediment like that found in our first dog or an attached body like that discovered in our second. Whatever may be the origin of these pathological conditions it is improbable that they are dependent on infection of the gall-bladder. Positive evidence on this point is unfortunately wanting, as I carelessly omitted to make cultures from the bile. Nevertheless it seems most likely that the changes observed are of diathetic rather than local origin.

Two leading questions are raised by these experiments: First, do the glandular alterations noted in the gall-bladder depend on the pathological conditions of fat metabolism, and secondly, do similar glandular accumulations occur in the human subject and sometimes form the beginnings of true gall-stones? An answer to these questions may reasonably be expected from additional experimental observations and from histological studies of the human gall-bladder.†

*Influence of Gout, Arteriosclerosis and Diabetes.*—Some writers have assumed the existence of a close connection between gout and gall-stones and various hypothetical‡ reasons have been advanced to explain the alleged connection. I have been unable to find any substantial evidence in favor of this relationship between cholelithiasis and gout. In the 179 Presbyterian Hospital cases which Dr. Williams has analyzed for me there is no instance in which a history of gout was noted, although some form of rheumatism existed in 20 of these patients. This showing is thus extremely different from foreign statistics like those of Lenac, where gout was present in 95 out of 166 cases of cholelithiasis. That gout and gall-stones should be often associated in countries where both diseases are common is not surprising and the fact does not in itself imply any etiological relationship.

*As red blood cells contain considerable cholesterni, pathological processes attended with excessive hemolysis might be expected to raise the cholesterin of the blood, but I am not aware of any observations bearing on this point.

†It is said that gall-stones occasionally contain as much as 16 or 17 per cent. of stearic acid. In a series of variegated gall-stones examined for me by Mr. Rettger stearic acid was positively detected in no instance, although in one case it may have been present in very small amount.

‡Analysis of the bile from this dog gave the following results:

| | |
|---|---|
| Cholesterin | .360 per cent. |
| Calcium oxide | .09 per cent. |
| Ethereal extract, not including soaps, but consisting of neutral fat, cholesterin and lethicin | .97 per cent. |
| Solids of bile | 20.29 per cent. |

Although the cholesterin residue was somewhat oily and contributed to give a high weight it seems clear that the cholesterin in the bile was increased considerably above the normal.

§The miliary projections were seen on histological examination to consist of groups of simple glands whose lumina were considerably distended with mucus.

*Analysis of the bile from this dog gave the following results:

| | |
|---|---|
| Ethereal residue after saponifying (including neutral fat, fatty acids, soaps and cholesterin) | 3.39 per cent. |
| Cholesterin found | .213 per cent. |
| Calcium oxide | .120 per cent. |
| Solids of bile | 22.09 per cent. |

Cholesterin figure is somewhat high on account of admixture of oily substance.

†I believe there is much to be learned about the pathology of the bile in its relation to cholelithiasis from systematic chemical and histological studies of the sediments so often found in human gall-bladders (even where autopsies are made early) and from histological studies of the mucosa of the dependent parts.

‡See Brockbank, loc. cit., p. 85.

As both arteriosclerosis and gall-stone disease increase in frequency with advancing years we cannot wonder that they should be often observed together in the second half of life. The statistical reports to which I have had access do not certainly establish a special etiological relationship. It is noteworthy that among Dr. Thacher's Presbyterian Hospital cases some form of arteriosclerosis (coronary disease or alterations of the aorta) existed in 80.4 per cent. But in order to give these figures any special significance it would be necessary to show that calculi are distinctly more common in arteriosclerotic persons than in persons of comparable ages dying from all other forms of disease. A study of Dr. Thacher's records from this point of view has been commenced by Dr. Williams but is at present not completed.

It has been often claimed that there is a close connection between diabetes and biliary calculi but a critical examination of the evidence does not sustain this contention. On the contrary it appears to me that gall-stones and diabetes are but rarely associated. Dr. Williams says that Kundrat observed cholelithiasis only once in 92 autopsies on diabetic patients. Of Dr. Thacher's 179 cases two died of diabetes.

The fact that gall-stones and diabetes are not more frequently associated has one important bearing on the theory of gall-stone formation. Bouchard, who has been a strong advocate of the constitutional hypothesis of cholelithiasis attributed the alleged relationship between the two diseases to the well known acid production of diabetes. He also believed that pathological acid production in other conditions than diabetes is a factor in causing gall-stone formation. If an acid intoxication ever exerts an influence on gall-stone formation, it should certainly make itself felt in diabetes, where very large quantities of pathological acids are often produced. Yet there is not reliable statistical evidence of this supposed effect; and it must be said that one would hardly expect the acid intoxication of diabetes to influence the reaction of the bile, as the pathological acid in the blood is so promptly neutralized by ammonia and other bases. There is thus no reason for supposing that free acid ever reaches the bile from the blood. This fact has not been sufficiently considered by those who favor the doctrine that acid intoxications have an influence on gall-stone production.

It is plain from what has been said that there is at present no unequivocal evidence that gall-stones arise from constitutional derangements unconnected with micro-organic invasions of the gall-bladder. On the other hand it is certain that the cholesterin of the bile can be considerably increased by local irritants unconnected with infection and it is likely that the requisite local conditions for such increase sometimes arise through purely metabolic disorders. While gall-stones are commonly the result of local infections we should carefully guard against the conclusion that they can never have a diathetic origin. It is at least highly probable that diathetic conditions are capable of so altering the composition of the bile as to materially favor the production of calculi in the presence of suitable local bacterial activities.

*Medical Treatment of Gall-stones.*—Few facts have as yet emerged from the nebulous region of gall-stone therapeutics. We have learned that the surgeon is far more successful than the physician in the treatment of established cholelithiasis. We have learned also that certainly most of the drugs to which cholagogue virtues were once attributed are really undeserving of confidence. The bile salts and possibly the salicylates possess cholagogue properties, but whether these can be turned to account to bring about the solution of a gall-stone must be considered very doubtful. It is certain that through the free use of fat in the dietary the percentage of fat in the bile may be increased above the average but we do not know whether the increase is ever so great as to cause a marked solvent action on the cholesterin of the gall-stones. Such an action appears to me improbable. Other constituents than cholesterin are insoluble in fat. The experimental results which we have obtained from prolonged feeding of fat raise the question whether it is really wise to give patients a rich oleaginous diet, especially in those substances where there is obesity and an inactive habit of life. Restriction both in fats and carbohydrates seems the more rational course and with this there should be free muscular exertion when this is practicable.

It seems probable that in future physicians who treat patients with gall-stones will direct their attention largely to measures designed to favor the subsidence of cholecystitis. How much it is possible to influence such a condition we cannot positively say. Hygienic influences that raise the general bactericidal powers of the cells presumably have a beneficial effect upon cholecystitis of infective origin. The value of antiseptics is a matter which future studies will have to decide but it is not unreasonable to hope that some bactericidal effects will be shown to result from the use of certain antiseptics, which like benzoic acid may enter the bile.

*Statistical Note.*—Dr. John S. Thacher, of the Presbyterian Hospital, was so kind as to place at my disposal the records of autopsies made there, and Dr. Lindsay Williams undertook to analyze these records with reference to their bearing on the incidence and etiology of gall-stones. Some of the results of Dr. Williams' analysis are of sufficient interest to incorporate in this report on the etiology of biliary calculi.

Among 2,371 autopsies gall-stones were found in the gall-bladder 179 times (7.6 per cent.). Of these gall-stone subjects 99 were females, 80 were males. But as the percentage of males among the entire number of patients subjected to autopsy was 65.5, the incidence of cholelithiasis was really a little more than twice as great in females as in males. The distribution of the cases as regards age was as follows:

| Males. | | Females. | |
|---|---|---|---|
| 10 years | 1 | 20 to 30 years | 7 |
| 10 to 20 years | 0 | 30 to 40 years | 19 |
| 20 to 30 years | 3 | 40 to 50 years | 19 |
| 30 to 40 years | 3 | 50 to 60 years | 20 |
| 40 to 50 years | 15 | Over 60 years | 23 |
| 50 to 60 years | 25 | Unknown years | 11 |
| Over 60 years | 29 | | 99 |
| Unknown years | 4 | | |
| | 80 | | |

Of 50 women about whom the facts were ascertainable 70 per cent. had borne children. The adipose was described as "fair," "considerable" or "abundant" in 113, as "scant" or "poor" in 59.*

No satisfactory information in regard to the chemical character of the gall-stones was reached in the majority of instances. In 32 cases the stones were single. In several instances large numbers of calculi were present; once there were more than 100, once 267, once the number exceeded 1,000. Very frequently there were from 12 to 40 stones in the gall-bladder. Frequently also there were present from 2 to 12 stones.

As to family history there is nothing notable to record, except that a family history of tuberculosis was obtained in 12 instances. As to personal history the following points were noted: Typhoid fever was present in 5 cases, but this of course gives no indication as to the number of stones of typhoid origin. Tuberculosis could be detected clinically in 7 patients and was several times found at autopsy, when it had not been recognized during life. Syphilis existed in 6 cases. A history of gall-stones or colic or obstructive jaundice was present in only 9 cases. In 33 cases the use of alcohol was admitted. In 20 cases there was a history of rheumatism in some form. No case of gout was known to exist, nor could a history of lacing be obtained in any case.

In 11 cases no note was made of the condition of the liver. In 50 cases this organ was normal or nearly normal (gross appearances). In 56 cases the liver was congested or nutmeg. In some of these the liver was also fatty or cirrhotic; the liver was markedly fatty in 28 cases, cirrhotic in 20. All but six of the 28 cases of fatty liver occurred in women, a large proportion of whom were over forty years of age. The preponderance of women with both gall-stones and fatty liver over men is therefore about twice as great as the preponderance of women over men in the entire series of cases. New growths were present in the liver in 9 cases, abscess existed in 6 cases.

Of the 87 cases in which suitable data exist as to the condition of the arteries, arteriosclerosis was present in 70 (80.4 per cent. of these 87 cases). In these cases alterations were found either in the coronaries or in the aorta or in both situations.

The total number of deaths referable directly to gall-stones or their sequelæ was 11 (6.1 per cent.). This low percentage is probably not referable to any considerable extent to the results of operative interference, as many of the cases occurred before the days of highly accurate diagnosis and early operation.

Perhaps the most striking thing about this analysis by Dr. Williams (to whom I am much indebted) is the large proportion of cholelithiasis patients who showed arteriosclerotic changes. It is not yet apparent, however, that this frequent association possesses any special etiological significance, as it is not clear that similar lesions in persons without gall-stones are not equally frequent at autopsies on patients of the same age, sex and habits of life. As the point is one of some interest a statistical comparison is now being made with a view to determining whether the high proportion of arteriosclerotic lesions in gall-stone cases has any etiological meaning.

I wish to express my sense of obligation to Dr. A. J. Wakeman and Dr. Helen Baldwin for their essential contributions to this paper, and to Dr. J. S. Thacher and Dr. Lindsay Williams for facts relating to statistical questions. I desire also to thank Dr. J. Edgar Welch for his zeal in obtaining for me the autopsy material on which Dr. Baldwin's analytical work is based.

*In some instances the body was described as emaciated.

## THE PATHOLOGY AND TREATMENT OF TARDY POSTOPERATIVE INTESTINAL OBSTRUCTION WITH A REPORT OF CASES.

BY ELLSWORTH ELIOT, JR., M.D.,
OF NEW YORK.

Acute obstruction following laparotomy is not a rare occurrence. It is most frequently the result of paralysis of peristaltic activity from a spreading or septic peritonitis; it occurs less frequently after laparotomy for a non-purulent condition, even though no infectious material has been introduced at the time of operation. In this latter group of cases, the obstruction is usually of a mechanical nature and is due to the angular adhesion of one or more loops of intestine to the parietal peritoneum, to each other or to the stump of some recently ligated pedicle of omentum or ligated base of tumor to a possible volvulus or to the protrusion of a coil of intestine through some accidental orifice in the mesentery or other peritoneal structure.

In all of these conditions, the symptoms indicating obstruction develop shortly after the operation and usually before satisfactory restoration of the intestinal function has taken place. On the other hand, "tardy" intestinal obstruction, following operation, refers to those cases in which an interval of weeks, months or even years elapses before the symptoms of obstruction appear—an interval, in which the patient enjoys excellent health and in which there is no irregularity in the movement of the bowel. In this group of cases the cause of the obstruction is always of a mechanical nature, the lumen of the intestine being narrowed by the contraction of a circumferential cicatrix within its wall or by the constriction of a

band without, beneath which the intestine has accidentally passed and subsequent extrication has proved impossible. In other cases, the stricture is due to the progressive kinking of a segment of intestine from the contraction of adhesions of organized connective tissue, joining together at an angle those loops of which the segment is composed. In many cases several of these conditions coexist.

Apart from the particular form of constriction, there is little variety in the lesion. The gross changes comprise one or more bands of connective tissue, in the formation of which the great omentum is a very frequent and important factor. These bands are attached to some fixed point on the parietal peritoneum or to some fixed or movable viscus. In this way it forms the portion of the boundary of a small aperture beneath which a loop of intestine becomes imprisoned and subjected to such constriction, that, in the absence of relief, necrosis is inevitable.

The adhesions between adjacent loops of intestine are formed of similar tissue of so firm a character, that the mass of intestine can be disentangled only with considerable difficulty and only by the generous use of forceps and scissors.

Stricture due to the constriction of a circumferential scar in the wall of the intestine is of the simple non-malignant variety and presents the usual features of that condition. To the outer surface of the stricture, the omentum and one or more loops of intestine are usually adherent.

Other pathological changes may be associated with those directly responsible for the obstruction; thus, adhesions and bands in more or less remote parts of the abdominal cavity are not infrequent and, in addition, the lesions, such as those of a chronic tuberculous peritonitis for the relief of which the original laparotomy was performed, may coexist.

Without interference, the constriction leads to necrosis or perforation of the wall of the affected gut with subsequent spreading peritonitis, a condition so well recognized as to require no further description.

The symptoms indicating obstruction develop either slowly or gradually: in the former group of cases, occasional attacks of constipation which are not sufficiently marked to attract the attention of the patient, with or without colicky pain, occur irregularly during a period of several months prior to the final attack of obstruction; in the latter group, symptoms indicating serious obstruction appear without warning or premonition of any kind: in both, the obstruction proper runs a rapid course. The treatment is prophylactic, in that by observing certain precautions and by careful attention to detail and technic both during and directly after the primary operation, the danger of the formation of permanent adhesions is very largely minimized. The treatment of the attack of the obstruction proper does not differ materially from the treatment of acute obstruction from any cause.

Prophylactic measures at the time of the original laparotomy include the careful exclusion of any kind of mechanical, thermal or chemical irritation from the contents of the abdomen. Thus, the utmost gentleness should be observed in the necessary manipulation of intestine and every precaution taken to avert the accidental catching of a loop with the edge of a retractor. The use of too hot saline fluid or of germicidal solutions containing some chemically irritant or caustic ingredient such as the bichloride of mercury, for purpose of irrigation, damages the visceral peritoneum and should be carefully avoided.

All ligatures, by acting as foreign bodes, are sources of mechanical irritation and should therefore not be needlessly applied; thus, many adhesions, the result of previous localized peritonitis may be divided without fear of hemorrhage; on the other hand, the pedicles of tumors or bands connecting these with the adjacent parietal peritoneum frequently contain large blood-vessels, requiring ligature, the irritant effect of which, however, can be diminished by the use of catgut rather than of silk. Another frequent cause in the production of chronic peritoneal adhesions is the presence of denuded stumps such as those of an amputated appendix or of the uterus and broad ligaments after a supravaginal hysterectomy. To obviate as far as possible band formation from this cause, the surgeon endeavors, prior to the closure of the abdomen, to cover all stumps with a smooth peritoneal investment. In the amputated appendix, this is accomplished by a purse-string suture around its base; in hysterectomy, by covering the uterine stump with a flap of peritoneum and by drawing together with Lembert sutures the parietal peritoneum on either side of the ligated broad ligament. In addition to these precautions, lines of suture may be covered, when feasible, with omentum, the adhesions which develop between such suture lines and omentum being preferable to angular adhesions of loops of intestine to each other.

Unfortunately, however, in certain laparotomies, the separation of extensive adhesions, involving the parietal peritoneum, the mesentery, and the hollow viscera exposes denuded areas so large that their investment with peritoneum proves impossible. In these cases an effort may be made to diminish the almost certain probability of band formation by covering the exposed area with a segment of very thin rubber tissue or of Cargyle membrane. Sufficient time has not yet elapsed to permit of an accurate estimate of the efficacy of this procedure in the human subject. The writer has observed in several instances, parietal displacement of pieces of Cargyle membrane from the wall of intestine due to the friction associated with the return of the affected loop into the abdominal cavity. Such displacement may be prevented in the case of rubber tissue by the passage of several sutures between it and the edge of the denuded area.

The management of drainage is an all important factor. The use of a drain in almost all laparotomies for abscess formation is indispensable; its

presence, nevertheless, is disadvantageous in that it favors band formation. Occasional exceptions are, however, noted from time to time in those cases in which, a second laparotomy being necessary, the adhesions observed at the time of the primary operation have either become insignificant or have entirely disappeared.

Notwithstanding occasional immunity from this danger, therefore, band formation, after the use of drains to such an extent as to prove a future source of trouble, is a distinct probability. The risk so incurred may be minimized by using as small an amount of drainage material as is consistent with the patient's safety and in the event of a capillary gauze drain, by enveloping the same in a cylinder or sheath of sterilized rubber tissue.

Furthermore, the early change of the drain with subsequent diminution of its bulk when it must be replaced, and, in certain cases, its early complete removal render the formation of permanent adhesions less likely.

The immediate postoperative treatment consists in establishing at the earliest possible moment, normal or preferably exaggerated peristaltic activity. During the first twenty-four hours, when the stomach is in an unsettled condition, the restoration of that function is favored by the use of rectal enemas of warm saline solution with or without turpentine and, in cases of persistent vomiting, by lavage. As soon as the nausea and vomiting subside, small doses of calomel and salts should be administered and movements favored by high turpentine injections. These measures avert to a certain extent not only the adhesion of intestinal loops but by the removal of all fermenting material, the development of adhesions from possible chemical irritation of toxic substances as they are absorbed by the intestinal wall, is very largely prevented.

The formation of adhesions is still further probably decreased by frequent changes in the position of the patient. This can preferably be accomplished by alternately raising and lowering the head or foot or sides of the bed. In this way, without discomfort to the patient the mobile contents of the abdomen may be directed to different parts of the cavity through the action of gravity.

These various measures are not cited as a part of the routine treatment of every laparotomy, but only when, after an extensive or infectious peritonitis, or after operations involving suture of the intestinal loops or after operation for the relief of obstruction due to bands subsequent band formation is to be apprehended.

The actual treatment of the obstruction proper does not differ essentially from the treatment of obstruction from any cause. Early laparotomy, the ligation and removal of constricting bands, the disentanglement of adherent intestine with resection (in those cases in which the loops are so firmly bound together that their separation is impossible, or in those cases in which the affected intestine has become necrotic), subsequent closure of the abdomen with or without drainage, together with the adoption of those measures already described, for the prevention, if possible, of subsequent adhesions, comprise the general routine treatment in these cases.

*Case I.*—Laparotomy for gangrenous appendicitis, complicated with general septic peritonitis; recovery. Acute obstruction seven weeks later; operation on the fifth day, death.

G. L., aged twenty years. With the exception of two attacks of catarrhal appendicitis during the past three years, patient has always enjoyed excellent health. About ten days before the patient was seen by the writer, the present attack began, the invasion being marked by severe pain, at first in the vicinity of the umbilicus, afterward referred to the right iliac fossa. During the first forty-eight hours there was vomiting and constipation, the latter yielding to catharsis. The pulse was at no time over 90 nor the temperature over 100°F. An examination by the attending physician showed general rigidity of the abdomen, most pronounced in the right lower quadrant, and tenderness on pressure. These symptoms continued for about one week, when the vomiting which had previously subsided, recurred and became fecal, the constipation absolute with the pulse increasing gradually to 120 and the temperature to 102° F. At the end of that time, an examination by the writer revealed a firm board-like abdomen without marked distention. There was slight dulness in the lower right quadrant. There was almost complete absence of peristaltic activity. Pulse varied between 130 and 140. General condition was apathetic. Operation under ether.

The appendix was exposed through the usual intermuscular incision. It was deeply situated, overhanging into the cavity of the true pelvis. It was gangrenous and surrounded by a small quantity of very foul smelling pus. There was a perforation near the tip. The cecum and adjacent coils of small intestine were distended, of a dark red color and injected and in places were covered with masses of fibrine. The pelvis and the lower half of the abdominal cavity were irrigated through a secondary incision in the median line below the umbilicus with a warm saline solution. Rubber tube drains, surrounded with iodoform gauze were introduced through both incisions converging into the bottom of the pelvis. Bandage.

For twenty-four hours after the operation, patient's condition was very critical, the pulse ranging as high as 150, and of poor quality. The fecal vomiting ceased immediately, however, and twenty-four hours after, the bowels moved to an enema. The temperature, never higher than 103° F., became normal about the tenth day, the pulse became normal during the third week. Both incisions closed by granulation, and were completely healed at the end of the fifth week.

I am greatly indebted to Dr. James E. Moore for the following notes of the subseqnent obstruction:

About seven weeks after the primary operation

complete constipation developed with symptoms of obstruction. A large dose of calomel and castor oil was immediately vomited. At the end of four days, Dr. Moore was called in consultation by the attending physician and advised immediate operation. The abdomen then had become moderately tense and distended. The peritoneal cavity was opened by an incision along the outer border of the right rectus, disclosing extensive adhesions in every direction, especially in the right lower quadrant. The bowel was greatly distended and rather dark-colored above a band in the upper right quadrant, being collapsed below the point of constriction. With the division of the band, the collapsed portion became gradually distended but only for a short distance when another band was encountered which produced very deep constriction. At least five strong bands and several smaller ones were divided and then the intestine was returned into the abdominal cavity and the wound sutured. The patient's general condition was as good after the operation as before. On the third day the bowels moved after a dose of castor oil and rhubarb, but on the following day patient gradually grew weaker and died.

*Case II.*—P. M., male, aged nine years. On October 24, 1901, about two o'clock in the afternoon, patient was knocked down by a cable car, but did not become unconscious. He complained of pain in the right wrist and hand, the head and the left side of the abdomen. There was pallor and profuse perspiration, and the patient was brought to the hospital in considerable shock. One hour after admission patient vomited green fluid, several attacks occurring in the course of the next two hours. During this time there were several attacks of colicky pain in the abdomen and the condition of shock continued. On examination, the upper two-thirds of the left side of the abdomen was tender and rigid. There was a point of maximum tenderness three inches to the left of the umbilicus. No mass could be detected. The patient lay on the left side and could not move toward the right without great pain. There was some dulness in the right flank. The left thigh was flexed. The pulse was slightly over 130. The rectal temperature about 100° F. Six hours after the accident, the abdominal tenderness had become more marked, and the rigidity had extended over a great segment of the abdominal wall. There was no appreciable improvement of the shock.

Operation eight hours after the accident, under gas and ether. The peritoneal cavity was opened by a 5-inch incision along the outer border of the left rectus above the level of the umbilicus. It contained turbid serum mixed with intestinal contents. A rupture was found in a coil of small intestine, involving one-third of its circumference. It was closed with a Czerny-Lembert suture. The adjacent coils of small intestine were injected and carefully cleansed with hot salt solution, as was also the pelvis which contained a considerable amount of partially digested intestinal matter. Drainage of the pelvis, with partial closure of the abdominal wound.

On the first day after the operation, the pulse was as high as 144, the temperature 102° F. On the third day, the pulse had decreased to 100, and the temperature to 99.5° F. Both became normal on the sixth day. For forty-eight hours after the operation, there was a moderate amount of vomiting. Bowels moved after enema on the second day. The abdominal incision had completely closed by the twenty-sixth day.

On January 16, 1901, the ventral hernia resulting from the primary operation was closed. In the course of the operation, the omentum and loops of intestine were found to be adherent to the edge of the hernial orifice and were separated before the sutures were inserted. The patient made an uneventful recovery.

On May 13, 1901, patient entirely well since last note until four days ago. At that time, after a hearty lunch, severe cramp-like abdominal pain developed, with vomiting and complete constipation. The vomiting at the time of admission to the hospital had become fecal. On examination, there was moderate distention, especially in the upper part of the abdomen. There was slight general rigidity. The vomitus was brown and of a fecal odor. The patient was in a condition of collapse, pulse 120, temperature 100° F.

Operation; gas and ether. The peritoneal cavity was opened by a median incision below the umbilicus. The small intestine was deeply constricted by an omental band near the posterior wall. Above this point, it was greatly distended, and below it was markedly collapsed. The division of the band was not followed by a return of the constricted portion to its original dimensions. It remained deeply indented and its wall seemed thickened from the deposit of connective tissue. No intestinal contents could be forced through. The loops of small intestine directly above and below the stricture were joined by a lateral anastomosis; closure of the abdominal wound. After the operation the temperature rose steadily to 105° F., the pulse to 190, and death took place seven hours afterward.

*Case III.*—K. L., aged forty-six years. This patient was operated on in the Presbyterian Hospital for a fibrocystic tumor of the uterus, October 10, 1899, by Dr. C. K. Briddon. Owing to the density of the adhesions, portions of the cyst wall adherent to the intestine were left behind at the conclusion of the operation. After the insertion of a gauze drain into the pelvis, the remainder of the abdominal incision was closed. There was some suppuration during convalescence.

Patient was readmitted Nov. 1, 1901. Four days before admisssion, after lifting a heavy weight, patient was seized with severe abdominal pain and vomiting which has persisted and become fecal. The constipation has been absolute with the exception of one slight movement following an enema on the first day after the attack began. Since then there has been no discharge of fecal material or flatus. There has been marked

prostration. On examination, the abdomen is prominent especially in the lower right and median zones. There is slight rigidity and tenderness over the tumefaction. Deep palpation under an anesthetic elicits a soft movable and slightly elastic mass. Vaginal and rectal examination negative. On admission, temperature is 100° F., pulse 132, and weak. Patient is in a condition of severe collapse.

Operation under ether. A median incision was made through the old scar and the peritoneal cavity opened. After the sponging away of free bloody fluid the intestine presented in a greatly distended condition and of dark purple color. Just above the ileocecal junction, the small intestine passed beneath a band by which it was tightly constricted, the intestine below being collapsed. The ligation and division of the band was followed by the gradual filling of the intestine below. No other constriction was found. The band seemed to pass from the mesentery over the intestine to the posterior parietal peritoneum and had no connection with any of the pelvic organs. The abdominal cavity was washed out with warm saline solution and closed quickly with sutures through the entire thickness of the wall, as the general condition of the patient was rapidly becoming weaker. Notwithstanding lavage, and infusions, the collapse became more marked and death occurred thirty-six hours after the operation.

*Case IV.*—J. R., aged nine years. Acute obstruction from constriction of a Meckel's diverticulum. Laparotomy. Recovery. Death six months later from some form of obstruction. Admitted to the hospital April 4, 1902. On the day before admission, patient was seized with severe colicky abdominal pains, situated about the umbilicus. There was vomiting from the very beginning, repeated at intervals of fifteen minutes during the night. Two enemata were given without any result and without bringing away any flatus. There was considerable prostration. One week before admission, patient fell, striking abdomen against the edge of a table, the accident being followed by slight pain of short duration.

On examination, the abdomen was generally distended, the left flank projecting slightly more than the right. There was slight tenderness all over but no distinct rigidity. No mass could be felt. There was some dulness in the left flank shifting with the change in the patient's position. Peristalsis could seldom be heard and is very faint. The pulse is 104, respiration 34 and temperature 98.6° F. There was 18,000 leucocytosis.

Operation under ether. The peritoneal cavity was opened by a median incision about 4 inches long beneath the umbilicus. It contained a moderate amount of clear serous fluid. To the right of the median line at a point just above the umbilicus a loop of small intestine had become caught beneath a Meckel's diverticulum which still remained attached to the umbilicus by a firm fibrous cord. This was excised, the diverticulum removed and the stump closed with a catgut suture and thoroughly cauterized. The abdominal cavity was irrigated with a warm saline solution, and the wound closed without drainage.

After the operation there was moderate nausea and vomiting, the latter persisting to the fortieth hour and then yielding to lavage. There was slight abdominal distention during this same period with restlessness, and the pulse varied between 100 and 120, the temperature ranging around 101° F. On the third day after operation a moderate amount of abdominal pain still persisted. This rapidly disappeared when flatus was expelled, and shortly after the bowels moved after enema. Primary union was secured and the remainder of convalescence was uneventful. Six months afterward the patient is said to have died with symptoms of obstruction at some place out of town.

*Case V.*—J. E., male aged 29 years. Admitted to the Presbyterian Hospital June 10, 1902, for chronic intestinal obstruction, which was followed by operation for suppurative appendicitis.

Two years ago patient was operated on in Germany for a suppurative appendicitis with subsequent drainage. Patient was in bed for four months after operation. Since that time the bowels have always been constipated, especially during the past six months, and for the past two weeks patient has been troubled with constant severe pain in and above the upper extremity of the old scar. Two days ago, while lifting a barrel, a swelling the size of a small orange appeared in the cicatrix, which disappeared spontaneously in about ten minutes. Shortly after this there were occasional attacks of vomiting, which persisted up to the time of admission. During the past forty-eight hours there has been no movement of the bowels. On admission the pulse is 80, the temperature 100° F.; patient complains of considerable pain. An enema was followed by a satisfactory movement of the bowels. On examination, there is an old scar about four inches long over the appendix site, between the anterior superior spine and the umbilicus. There is no distention. There is a distinct area of resistance between the upper edge of the scar and the umbilicus, about the size of an egg, and this area is tender on deep pressure. Repeated examinations of the blood never showed a leucocytosis higher than 9,000. The patient was placed in bed, and the diet regulated. The pain, however, and the local resistance persisted, notwithstanding regular movements of the bowels.

Operation on June 20 under ether. The scar was excised by means of an elliptical incision which was deepened along the edge of the cicatricial tissue until the peritoneum was opened. The cecum presented adherent to the parietal peritoneum and from the end of the anterior fibrous band, the stump of the appendix, about an inch in length, extended up and inward to a point on the parietal peritoneum where it was closely adherent. In the aperture so formed a loop of small intestine had become imprisoned and was moderately constricted. The adhesion was divided,

the appendix amputated and the intestine released. The stump of the appendix was buried with a purse string suture of catgut, and the muscular and aponeurotic planes of the abdominal wall were approximated with chromic sutures without drainage. Primary union was secured, the convalescence being uneventful.

*Case VI.*—D. W., aged 22 years. Acute obstruction following a previous internal operation for appendiciticis. Recovery.

On May 16, 1902, patient was operated on by the intermuscular incision for appendicitis. The distal end of the appendix was atrophied and adherent to the iliac fossa. There was no pus. Its removal was accomplished without difficulty and the wound was closed without drainage, primary union being secured and the patient leaving the hospital in three weeks. The stump of the appendix was tied with heavy catgut and cauterized. No attempt was made to bury it with a purse-string suture. Patient remained well until Oct. 1, 1902. In the interval there had been occasional attacks of pain in the right inguinal region intensified by walking and during menstruation. The bowels had remained fairly regular until two days before admission, when patient was seized with severe abdominal pain and persistent vomiting. During this time there has been no movement nor the passage of any flatus. The past few hours the vomiting has become brown, but is not of a fecal odor. On examination, the abdomen is slightly distended throughout. There is tenderness and rigidity, most marked just internal to the old appendix scar. No mass can be felt. The abdomen is tympanitic in front as well as in the flanks. General condition is that of very marked prostration, the pulse being 120 and the temperature slightly above normal.

Immediate operation under gas and ether. A median incision four inches in length was made below the umbilicus, opening the peritoneal cavity, which contained a small amount of clear serous fluid. The small intestine was moderately distended and was caught beneath a firm band, extending from the omentum to what appeared to be an appendix epiploica on the wall of the cecum, but which may have been the region of the former appendix. The band was divided, the intestine released, and the cecal attachment of the band buried with a purse-string suture of catgut. The abdominal cavity was irrigated with a hot saline solution and was closed without drainage. Uneventful recovery. Primary union.

*Case VII.*—J. K., aged 22 years. Penetrating pistol shot wound of the abdomen. Laparotomy; recovery. Acute obstruction from a band and from kinking of the small intestine six months later; laparotomy; recovery.

Patient has always been robust. In June, 1902, patient received a pistol shot wound of the abdomen and was taken in an ambulance to Gouverneur Hospital, where, two hours after the accident, a laparotomy was performed, and eight wounds in the wall of the small intestine and two in the mesentery were closed with sutures. In order to minimize the risk of subsequent adhesion, each perforation, with the exception of two, which were in close proximity to the mesenteric border, were closed with purse-string suture of silk and one suture over this to secure firm apposition. The bleeding vessels in the mesentery were ligated with catgut. A very moderate amount of gauze drainage was introduced to the point of suture and the abdomen elsewhere closed. The patient made an uneventful recovery; the patient passed flatus twenty-four hours after the operation and on the second day the bowels moved to enema. At no time was there any nausea or vomiting. Primary union was secured except at the central part of wound through which the drain protruded, and this was closed entirely by granulation by the end of the fourth week. Since then the patient has enjoyed excellent health until five days before his admission into the Presbyterian Hospital. At that time, about six months after the primary operation, patient was seized with severe colicky abdominal pain and persistent vomiting. There was complete constipation, and the patient was admitted to the hospital in a condition of collapse, with a pulse of 120 and temperature of 102° F. On examination, the abdomen was greatly distended and everywhere rigid. The greatest pain and tenderness was just above and to the right of the umbilicus. The tympanitic note was general.

Operation on Dec. 24, 1902, under gas and ether. The peritoneal cavity was opened by a median incision just above and below the umbilicus. There was a considerable amount of clear serous fluid within it, and the intestine immediately presented in a greatly distended condition. In the lower part of the cavity other loops of intestine in an extremely collapsed condition were observed. A strong band extending from the omentum to the posterior parietal peritoneum with the small intestine beneath and tightly constricted by it was found in the posterior part of the abdominal cavity on the right side at about the level of the umbilicus. This was divided and the intestine released. In addition, loops of small intestine were found adherent to each other and to the mesentery and when these were divided and the intestine straightened out the adhesions were seen to have formed at the points where the previous intestinal and mesenteric perforations had been closed, the silk sutures being still plainly visible in the wall of the intestine. The separation of these adhesions left denuded areas so extensive that they could not be covered satisfactorily with any serous investment. They were accordingly covered with Cargyle membrane, and the intestines returned into the abdominal cavity after they had been thoroughly washed and the abdominal cavity carefully irrigated with hot saline solution. The abdomen was closed without drainage.

After the operation the patient was restless and at times delirious. He was given early and repeated rectal injections containing turpentine, and the sides and extremities of the bed were alter-

nately elevated and lowered. The bowels moved abundantly from the second day. The delirium ceased on the fifth day, and from then on the convalescence was uninterrupted. Primary union was secured. At the end of about three weeks patient left the hospital. About five weeks after the operation patient had some abdominal pain and vomiting, continuing for about twenty-four hours, which he ascribed to some indiscretion in diet. Since that time, however, the patient has been completely well.

## MEDICAL PROGRESS.

### SURGERY.

**Complications of Artificial Anus.**—In a paper dealing with this subject, H. Géraud (Rev. de Chir., August 10, 1903) takes up the pathogenesis, etiology, symptomatology and treatment of two of the most frequent complications, namely: Prolapse of the mucous membrane, and prolapse of the intestine itself. Eversion of the mucous membrane is usually present in artificial anus; but exaggeration of this condition may lead to more or less marked prolapse and constitute a real complication. In this event, a mucous cylinder is seen which may be from 3 to 11 cm. in length. This, at first thin, supple, and easily reduced, becomes thickened, ulcerated, and irreducible; in which case a radical operation is indicated. This latter consists in resection of the protruding mucous membrane; a sufficient margin being left to permit suturing the membrane to the cutaneous orifice. Prolapse of the intestine is simple or double, according as one or both ends protrude. It is usually preceded by eversion of the mucous membrane; the latter being forced out under the influence of intra-abdominal pressure and at a given moment, the intestine following it. The intestinal opening having no sphincter, there is nothing to oppose its escape. A large abdominal orifice is the most potent predisposing cause of prolapse of the intestine; the determining cause frequently being some muscular effort. Prophylactic treatment is most important. The patient should be advised to accomplish defecation in the horizontal position and without effort of the abdominal muscles. Violent exertion, overfatigue, and excess of nourishment should also be interdicted. The chief point, however, is the use of such an appliance as will allow the escape of gas while still exerting pressure, not only upon the borders, but upon the whole orifice. If the prolapsed intestine is reducible it may be replaced and sutured in position; or the mass may be excised like a tumor, the subsequent treatment being like that used by Mikulicz in prolapsus of the rectum. In the event of irreducible prolapse, ablation is imperative and the author favors Gosset's method.

**Toilet of the Peritoneum in Appendicitis.**—No one method is suitable for all cases, for they vary much in the extent of operative work required, and in the difficulties encountered. According to S. H. Weeks (Ann. of Gyn. and Ped., August, 1903), when the operation is made before pus has formed, or during the interval between the attacks, no pus being present, no drainage is necessary. The appendix being removed, and the region being dried with pads of sterile gauze, the external wound is completely closed. Where there is a circumscribed abscess, care should be taken not to infect the general peritoneal cavity by forcible irrigation, which is liable to force the purulent pus among healthy intestines. The wound and abscess cavity should be packed with sterile gauze. Where the wall of the abscess is firmly adherent to the anterior wall of the abdomen, and can be opened without opening the uninfected abdominal cavity, this should be done. The point of adhesion should be carefully searched for, and the abscess opened at this point. Careful search should be made for concretions, as the neglect to find and remove them may lead to a troublesome sinus. Here the abscess cavity should be carefully evacuated and cleansed with gauze pads, on irrigation, which can be safely used without fear of infecting the healthy peritoneum, after which the whole cavity should be packed with gauze. The greatest care should be taken not to break down the abscess wall at any point. A fourth and a very important class of cases includes those in which there is no protecting wall of adhesions, and the products of a septic peritonitis have flooded the whole abdominal cavity and the intestines are floating, so to speak, in the septic fluid. All these cases require the thorough removal of the septic fluid and a cleansing of the intestines, which sometimes may require their removal from the abdominal cavity. This cleansing is best done by means of irrigation, several times repeated. After thorough cleansing by irrigation and sponging, a glass drainage-tube, open at both ends, and a strip of gauze pushed through it from end to end, should be passed well down into the pelvic cavity, and the whole infected area packed with gauze. Strips of gauze should be packed in various directions among the intestines, so that perfect capillary drainage may be secured throughout.

**Detachable Plaster Cast.**—An ingenious method of applying a plaster cast, which will permit the carrying out the more modern treatment of fractures by combined immobilization and massage, is described by C. O. Bechtold (Jour. Am. Med. Ass'n., September 5, 1903). The cast is applicable to any part of an extremity where a cast or a splint can be used, but for convenience, he details that intended for a Pott's fracture. The novel element is the employment of a Gigli saw. The limb is covered with a stocking or wrapped up in cotton and a Gigli wire saw applied in the median line anteriorly and posteriorly. Both of these are secured by a few turns of plaster bandage and a third saw is applied along the sole of the foot and similarly secured. The cast is then completed by successive turns of the plaster bandage, but is made somewhat thicker than usually. Care must be taken to leave the ends of the saws free, and not to bend them at sharp angles. As soon as the cast is completed and before it dries, it is cut through by means of the saws, which may be readily accomplished in about ten seconds. A roller bandage is then applied to hold the two halves of the cast together. When they are fully dried, they may be removed as often as necessary for the application of massage, hot applications, and inspection.

**The Omentum as a Protective Organ.**—It is only within the last few years that the importance of this organ has come to be recognized. Its function has, however, never been thoroughly investigated, and the animal experiments of E. Renzi and G. Boeri (Berl. klin. Woch., August 24, 1903) should therefore prove of general interest. They investigated the function with especial reference to other abdominal organs, particularly the spleen. If the main stem of the splenic artery or vein in a dog is tied off, the spleen, after 2 1-2 months, still retains its integrity, and the circulation is almost undisturbed. It is probable that the omentum sustains the circulation, at least in part, for it is often found lying on the spleen, its vascularity is increased, and in separating the adhesions, considerable bleeding is caused. This activity of the omentum in restoring the inhibited circulation affords encouragement for such operations as

that of Talma's for a disturbed portal circulation. If the blood supply to the spleen is entirely cut off, the organ becomes necrotic. But even after several days the omentum is observed to have surrounded the organ and in ten days it has formed a dense network around the spleen, in the center of which lies the organ, encapsulated, diminished in volume, and in a state of disintegration. After twenty days, it is no larger than a nut, and enclosed in a fibrous capsule with walls about 2 to 3 mm. thick. In 2 1-2 months there is scarcely any trace of the spleen left, except a small fibrous nodule, almost complete absorption having evidently taken place. The animals gave no symptoms of this process going on in their interior. If the circulation is entirely cut off and the omentum excised as much as possible, encapsulation does not take place, the spleen becomes necrotic, but no absorption follows, and the animal dies within twenty-four to forty-eight hours. If this operation is done in two stages, the vessels being tied off about eight to ten days after the omentum has been extirpated, death does not come on until three to ten days later. Neither one of these operations alone is fatal, but death is caused when both are done together, and is due, the authors believe, to the extraordinary toxic qualities of the disintegration products of the splenic tissue. The absorption of these is more or less hindered by the encapsulation produced by the omentum. It was also determined that the same thing took place when a kidney was tied off; encapsulation by the omentum being followed by slow degeneration and subsequent absorption. Foreign bodies introduced into the peritoneal cavity were likewise surrounded by the omentum, and apparently remained without causing any further trouble. The authors believe that these observations not only clear up the question as to what becomes of certain internal organs which may become cut off from their circulatory supply, but also serves to indicate certain therapeutic applications which are rendered possible by what is now known of the functions of the omentum from these experiments.

**A New Method of Reducing Posterior Dislocations of the Hip.**—The following new method for sciatic dislocations of the hip is described by J. ELGART (Centralbl. f. Chirurg., August 22, 1903): The narcotized patient is placed on the floor, his dislocated limb held over the knee of the surgeon, with the patient's knee at right angles, and the pelvis steadied by an assistant. By seizing the leg at the ankle and pressing downward the head of the femur will move upward, the surgeon's knee acting as fulcrum. Inward rotation of the femur is also practised by pushing the leg outward. With the free hand, the prominent head of the femur is seized and pressed outward so as to assist its gliding over the cartilaginous ring.

**Acoine and Cocaine for Local Anesthesia.**—Good local anesthesia has been obtained by W. KRAUSS (Münch. med. Woch., August 25, 1903) by means of a solution containing acoine 0.025 gm. (½ grain), cocaine 0.05 gm. (1 grain), physiological salt solution 5 gms. (1¼ drams). The solution should be prepared fresh. The best results were obtained in (1) Enucleation of the eye. A syringeful is here injected along the muscular insertion of the recti muscles. (2) Strabismus operations of children and sensitive adults. Half a syringeful into the neighborhood of the muscle will suffice. (3) Small operations upon the conjunctiva. (4) All operations upon the lids. (5) Extirpations of the lacrymal gland or sac. (6) Occasionally for operations in the vicinity of the eye, as in the removal of dermoids.

**Treatment of Penetrating Abdominal Wounds.**—It is a mistake, according to H. GEBELE (Münch. med. Woch., August 18, 1903) to treat penetrating abdominal wounds in civil life, according to the same conservative principles as during war. In peace, the conditions of asepsis are better and the bullets have less force of penetration, and cause larger perforations of the gut, so that an early laparotomy is almost always indicated, especially since the symptoms of perforation or hemorrhage often make their appearance too late. Secondary abscess, perforation, and the formation of strictures, so common after expectant treatment, are also avoided. Intestinal wounds are best managed by intestinal resection and suture or Murphy button. Hepatic hemorrhage ceases after suture with heavy catgut. Injury of the spleen calls for splenectomy. Shock is no contra-indication for operation, but ether should be employed. Otherwise chloroform, preceded, if possible, by several doses of strophanthus, is the best anesthetic. Local anesthesia will hardly ever be applicable on account of the unavoidable traction on the parietal peritoneum. Postoperative shock requires subcutaneous salines. To avoid paresis of the intestines, the operation is performed as rapidly as possible, and a rectal tube is inserted soon after the wound is closed. If flatus is not expelled in twenty-four hours, 100 to 150 cc. of pure glycerin is injected through the tubes. In 3 to 4 times twenty-four hours the patient may receive small doses of castor oil. The injection of an aperient into the intestines during operation may also be tried. Atropine has had no effect in the writer's hands, but the paresis sometimes disappeared after two daily doses of one milligram of physostigmine salicylate.

**Spinal Cocainization with the Addition of Adrenalin.**—After the enthusiasm of several years ago had subsided, spinal anesthesia has gradually gone out of fashion, and it is doubtful if to-day it is still practised as routine in any clinic. The great danger of intoxication is responsible for this, but luckily experiments have not been wanting to reduce the risk and thus save an otherwise excellent method from complete oblivion. A. DÖNITZ (Münch. med. Woch., August 25, 1903) reports a number of experiments in cats, on the combined use of cocaine and adrenalin. Where both drugs were injected simultaneously, three times as much cocaine was necessary to kill the animals; if the adrenalin was injected six minutes before the cocaine, five times as much was required. The adrenalin itself in the usual dose is innocuous to both man and animals. The experiments were then repeated with surgical cases, and it was found that a much smaller dose of cocaine was necessary to bring about the desired anesthesia. The most severe operations could be done after half a centimeter of adrenalin solution (1:1000) diluted with the same amount of water and followed by 0.0075 to 0.015 cocaine. After effects were slight or absent entirely.

**Electrothermic Hemostasis.**—The following are the advantageous features that are claimed for this method when the Downes instruments are employed by A. GOLDSPOHN (Am. Jour. of Obst., August, 1903): (1) Patients are more comfortable after operation, because the nerves so treated in the stumps are insensitive, which is not true in the ligated stump; (2) as these pedicles are probably sterile, and become disintegrated and absorbed, they cannot give rise to adhesions of viscera, as we know that ligated stumps so often do. (3) There is less blood lost, because this procedure is complete and wholly an antecedent or preventive one, which is not so true of hemostasis by ligation, in which it is often better to avoid the formation of large stump by preceding ligation en masse, and to tie the individual spurting vessels after the severing incision has been made. And when this cut is made within the extent of the band of baked tissue, as can be done after the larger

forceps have been used, there is no show of blood on either side of the incision. (4) This method of hemostasis is certainly more nearly ideal, because it does not involve the introduction of a foreign body, and it is more nearly ideally aseptic than is the use of any kind of ligature material which always implies the possibility of its not being aseptic, either from defective preparation or from manipulation with the only omnipresent instruments (the hands), which cannot be boiled. (5) In vaginal hysterectomy it is superior (*a*) in cancer cases, because it most nearly destroys the tissues which otherwise compose the stumps or pedicles, and thereby diminishes the chance for a recurrence, both from imperfect removal of diseased tissues and from implantation or from manipulation with the only omnipresent in- every instance of this operation it is of distinct advantage, because it does away with a most difficult and tiresome form of ligation, and also the very objectionable use of clamps, etc.; (*c*) thereby facilitating a very important part of the operation, *e.g.*, closure of the intestinal cavity and an avoidance of a very important chain of intestinal disorders, which so often follow the sojourn of a foreign body within the peritoneal cavity; (*d*) by avoiding ligatures, it avoids danger of secondary hemorrhage, and also of infection from such ligatures, when they become infected before they are absorbed or cast off.

## PHYSIOLOGY.

**Heat Production and Metabolism of the Embryo.**—That the embryo of warm-blooded animals is subject to a very active metabolism, and that the developmental processes are accompanied by marked transformations of energy, are maintained by C. BOHR and K. A. HASSELBALCH (Skand. Archiv f. Physiol., July 23, 1903). They find that the value of the respiratory quotients, as well as a consideration of the chemical constituents of the egg and of the heat produced by oxidation of the egg, leads to the conclusion that the respiratory metabolism during the development of the embryo of the hen, is the result of the oxidation of the fatty constituents. The amount of energy estimated upon this basis, corresponds to the amount of heat that is produced during the entire period of embryonic life. As there is no ground for assuming that any other tissue than fat is a source of energy during embryonic existence, the authors believe that all the chemical energy produced in such large quantity leaves the egg solely as heat and is in no way concerned in the formation of new tissue.

**The Action of Glycerin and Veratrin on Striated Muscle.**—The interesting field of neuromuscular physiology is richly extended by the important discovery by C. G. SANTESSON (Skand. Archiv f. Physiol., Vol. 14, Nos. 1, 2 and 3) that in frogs injected with large doses (.5 to 1. gm.) of glycerin, if the nerves or muscles be afterward stimulated by means of very weak induced opening shocks, there occurs not a minimal single contraction but a tetanus of extreme height enduring for a long time. Curare does not prevent this action of glycerin on the muscles but reduces the excitability of the latter to a marked degree. If two muscle-nerve preparations from a frog poisoned with glycerin be examined, it is found that the one which is tested the later shows a greater excitability to induced shocks. The current of action produced in a pulsating frog's heart is sufficient to throw a muscle poisoned with glycerin into tetanus. Applied to a muscle directly, strong solutions of sodium chloride, sugar, veratrin and glycerin produce a more or less pronounced contracture, the last, however, increasing the muscular irritability besides. The veratrin-contracture with its slow rhythmical undulations remind one of the wave-phenomena inherent in sarcoplasm, as studied by Fano, Bottazzi and others. The following differences are noted between the contracture of veratrin and the tetanus of glycerin. The latter increases irritability more than veratrin. The form of the glycerin-curve is that of a tetanus; the form of the veratrin curve is one of a single contraction with contracture superadded. Continued stimulation increases the response in veratrinized muscle but diminished it in glycerinated muscle. There are marked differences in the form of action-current produced in these two forms, the latter displaying during the period of tetanus a continued vibration. The glycerin-tetanus spreads to neighboring muscles and seems to depend upon the fact that the muscle rendered abnormally irritable by the glycerin, is stimulated again and again for a long time by its own currents of action. While veratrin acts chiefly upon the sarcoplasm, glycerin affects all the structures of the muscle. Microscopical examination reveals in glycerinated muscle certain gaps in the periphery of many fibers. The significance of these is unknown. No coagulating effect of glycerin has been observed, its influence depending probably upon its power to extract water. The strength of this tetanizing power of glycerin depends, in the author's opinion upon the ease with which glycerin osmoses into the substance of the muscular fibers, increasing their irritability and conductivity. That an agent like glycerin, which, by virtue of its influence on the physicochemical properties of the muscle and only these, produces its effect, in the form of such uncommonly powerful changes in the functional capacities of this organ, is an argument in favor of the doctrine that the muscular contraction is brought about by a change in which physicochemical forces play the leading rôle.

**Contributions to the Phenomena of Narcosis.**—In studying the effect of narcosis by means of nitrogen gas upon the structures of the nervous system, F. W. FRÖLICH (Zeitschrift f. Allgemeine Physiol., Vol. 3, No. 1) found that nerves and nerve-cells are affected in the same way—in both narcosis diminishes the assimilation of oxygen. The oxygen that is stored up in the nerves is dependent on the partial pressure of this gas and can, in spite of deep narcosis, leave the nerve unhindered.

**Effect of Thyroid Feeding on Nitrogenous Metabolism.**—In treating a case of myxedema, J. A. ANDERSON (Skand. Archiv f. Physiol., Vol. 14, Nos. 1, 2 and 3) observed that thyroid medication brought about an increase in the metabolism of proteids, and that this increase cannot be prevented by excessive feeding of fats and carbohydrates. The author maintains that the thyroid gland elaborates a substance which stimulates the processes that make for the disintegration of the tissue-proteid.

**The Elective Conductivity and Osmotic Pressure of Animal Tissues.**—In an investigation of various tissues (heart and spleen of the turtle and muscle of the frog), G. GALEOTTI (Zeitschrift f. Biologie, Vol. 45, New Series, Vol. 27) finds that during the transition from life to death there is a reduction in electric conductivity, while the molecular concentration remains the same. From this it is concluded that during the process of death the reactions of the protoplasm are changed in such a way that the number of free ions is diminished, while the number of actively osmotic molecules is subject to little or no variation. It is possible to bring about similar reactions between proteids and certain salts artificially. They are of eminent significance from the standpoint of the physicochemical investigations of the proteid bodies. The onset of putrefac-

tion is accompanied by a marked increase in electric conductivity and molecular concentration, which can easily be explained if one take into consideration the fact that the splitting processes accompanying putrefaction cause a marked increase in the number of ions, and of electrically neutral but osmotically active molecules.

**The Source of Indican in the Animal Body.**—It has been established by experiment and clinical observation according to H. SCHOLZ (Hoppe-Scyler's Zeitschrift, June 19, 1903), that as the result of the activity of certain bacteria in the intestinal canal and in other regions (*e.g.*, in the pus of empyema), indol is formed, which, after absorption, is excreted in the urine as a salt of indoxyl sulphuric acid, namely, indican. It has been maintained by many authors that there are other sources besides bacterial putrefaction for indican. Its excretion in large amounts in fasting animals suggested the hypothesis that indol may be formed by the non-bacterial disintegration of albumin. Observations made by many authors in fasting animals and human beings have failed to find a constant verification of this phenomenon. Clinical observations have suggested many morbid conditions in which indol has been supposed to result from non-bacterial decomposition of albumin. Senator observed a much more marked indicanuria in chronic than in acute diseases, particularly in chronic wasting and inanition disorders. Other diseases in which an increased indican output has been observed, are gastric carcinoma, pleurisy, pneumonia, progressive phthisis, glycosuria and Addison's disease. The indicanuria accompanying alimentary glycosuria, as observed by Gilbert and Weil, was prevented by the administration of liver-extract. In none of the above diseases have all observers been able to confirm the statement that an increased secretion of indican results. Moreover, in no instance has there been excluded the possibility that the condition of the bowels and the form of diet (*e.g.*, meat diet in diabetes) might have been the cause of a bacterial indicanuria. Moreover it has not yet been proved that the microbic agents in certain infectious diseases in which indicanuria has been observed, are not able to cause the formation of indol. Again, authors have contented themselves with a mere qualitative determination of indican, which is, of course, unreliable. Some investigators, by means of injections of small non-toxic doses of oxalic acid and phloridzin, have been able to produce indicanuria. These observations the author has not been able to confirm. He reaches the conclusion that an increased indicanuria following causes other than putrefaction has not been proved.

**Blood Change After Hemorrhage.**—In comparing the effect of hemorrhage upon the composition of normal blood with that during the administration of iron and arsenic, E. P. BAUMANN (Jour. of Physiol., Vol. XXIX, No. 1), finds that hemorrhage produces a general deterioration of the blood and serum, especially of the former. The leucocytes are increased, the change consisting chiefly of an increase of the polymorphonuclear, occasionally of the mononuclear cells. The specific gravity of both blood and serum is less altered than the remaining factors. The solids, proteids, and total nitrogen of both blood and serum are more or less equally affected. The qualitative change in the serum-proteids consist in an increase of serum-albumin at the expense of the serum-globulin. The fibrin is increased and the coagulation rate shortened. The blood-ash remains practically unchanged. Hemorrhage during the administration of inorganic iron produces a general deterioration of the blood and serum, the latter being considerably less affected than by hemorrhage alone. The hemoglobin is increased above its original value, while the red corpuscles are even more diminished than by hemorrhage alone. The leucocytes, both quantitatively and qualitatively, are affected as by hemorrhage alone. The same applies to the specific gravity of both blood and serum, and to the solids, proteids and total nitrogen of the blood. The solids, proteids and nitrogen of the serum are affected in varying degrees. The alteration in the fibrin and the coagulation rate correspond to those produced by hemorrhage alone. Hemorrhage during the administration of organic iron produces alterations in the blood and serum closely resembling, but less pronounced than those under hemorrhage and inorganic iron. Hemorrhage during the administration of arsenic produces changes in the total blood which in every respect closely resemble those caused by hemorrhage alone, with the exception that the number of leucocytes is diminished instead of increased. The condition of the serum, however, resembles that produced by hemorrhage and inorganic iron, *i.e.*, it is better than under hemorrhage alone, but not so good as in hemorrhage and inorganic iron. Hemorrhage during the combined administration of iron and arsenic produces a degree of deterioration which is much less marked than that produced during the administration of either of these drugs singly.

**The Nature of Adrenalin Glycosuria.**—The subcutaneous administration of adrenalin in dogs and rabbits causes a true glycosuria and glycemia, according to D. N. PATON (Jour. of Physiol., Vol. XXIX, No. 3), the degree of which depends largely upon the amount of carbohydrates in the body, but which occur when stored carbohydrates have been eliminated. The glycosuria is apparently due to a diminished utilization of sugar in the tissues, since it is not due to a mere increased formation of glucose or to increased excretion of sugar by the kidneys. That the effect is due to a toxic action of the adrenalin and that it is not caused by an interference with the processes of oxidation due to the vascular changes, is indicated, first, by the extent of the glycosuria—which is far more marked than that observed as the result of mere interference with oxidation, and secondly, by the fact that the glycosuria is slight in guinea-pigs where the vascular changes are much more prominent. The observations of Herter support the view that the toxic action is not a direct one, but that it operates through the pancreas. During the prolonged daily administration of adrenalin, days may occur on which sugar does not appear in the urine. A distinct tolerance of the drug is established. Diacetic acid and aceton have not been detected in the urine of dogs, but a dark red ring at the junction of the urine with nitric acid is constantly present. The study of the proteid metabolism shows (1) That the sugar is not entirely derived from the breaking down of proteids, (2) that there is a markedly increased production of ammonia and (3) that, on an insufficient diet, the decomposition of proteids is markedly increased, while the absorption of proteids is not interfered with. The proteid metabolism under adrenalin thus benaves as it does in ordinary diabetes.

**Exercise and Urinary Secretion.**—The early excretion of sulphuric acid appears to be a constant feature in the metabolism which accompanies rapid muscular exercise, according to G. C. GARRATT (Jour. of Physiol., Vol. XXIX, No. 1). The acid seems to pass out in combination with potassium and ammonium, and the maximum output occurs several hours before that of total nitrogen. The increased excretion of phosphoric acid resulting from exercise bears close relation to that of free acid and urea. The acid appears to be eliminated chiefly in combination with the alkaline earths and am-

monium. The normal relation between sodium and chlorine does not seem to be conspicuously disturbed by exercise, nor is the usual influence of increase in the urinary water upon them prevented thereby.

**The Nature of the Pancreatic Ferments.**—Arguing from the results obtained in previous investigations and in the one on the precipitability of pancreatic ferments by alcohol, H. M. Vernon (Jour. of Physiol., Vol. XXIX, No. 3) concludes that the tryptic and rennetic ferments do not exist as independent chemical entities. On the contrary they form a single complex molecular group, of which various side-chains possess various powers, as of digesting proteids or of coagulating milk, which can be independently exerted. Moreover, these side-chains possess various degress of stability, and it is possible for them to be destroyed, one at a time, without the activity of the remaining side-chains being in any way affected.

**The Spleen and Hemolysis.**—The physiology of the spleen is still the subject of diligent investigation and heated debate. It has recently been shown that this organ has no important action as a blood forming organ. In studying the experimental evidence of the connection of the spleen with the breaking down of the blood cells, D. N. Paton and A. Goodall (Jour. of Physiol., June 15, 1903) find that the removal of the spleen is not followed by any rise in the number of erythrocytes or leucocytes. The excess of erythrocytes added to the blood by injecting the defibrinated blood of animals of the same species, disappears at the same rate in animals with and in animals without the spleen. Hemolytic agents my be divided into (*a*) solvents of hemoglobin from the erythrocytes and (*b*) toxic agents to the erythrocytes. Injection of the first class (water) leads to an exactly similar hemolysis and recovery in the normal and in the spleenless animal. The injection or administration by the mouth of the second class (phenylhydrazine and toluylendiamine) causes the following changes in normal and in spleenless animals: (1) A great destruction of both red and white cells results in an anemia which in many features closely resembles pernicious anemia, but which is completely recovered from about the twentieth day. (2) In the organs there is a very great deposit of pigment, which gives the reactions of free iron, occurs most markedly in the spleen (when present) and next most markedly, in order, in the lymph-glands, bone-marrow, kidney, liver and cortex of the suprarenal capsules. Most of the pigment is contained in cells—large leucocyte, or endothelial cells—or is deposited along the fibrils of connective tissue. The splenic reticulum may thus be mapped out by the pigment, active regenerative changes, leucoblastic and erythroblastic, are confined to the bone-marrow where megaloblasts are also found when the regenerative changes are most marked. These megaloblasts indicate a reversion to the fetal type of blood formation and are only found in the circulating blood of man in pernicious anemia and a few allied conditions. The only difference between splenectomized and normal animals is that about the fourth day a slightly less degree of anemia is produced in the spleenless animal, because of the less rapid and complete removal of the dead erythrocytes from the circulation. The anemia induced by feeding rabbits upon a diet poor in iron and proteid (rice), is more marked in spleenless than in normal animals, the spleen apparently acting as a storehouse for iron, which would otherwise be lost. There is thus no evidence that the spleen has any active hemolytic functions. It is rather a scavenger of the blood, removing dead erythrocytes, breaking down the hemoglobin and retaining the iron for use in the regeneration of the blood cells.

## PEDIATRICS.

**Antenatal Rigor Mortis.**—Rigor mortis is to be considered an unfailing sign of death and, according to the now almost generally accepted theory of Brücke, which has been proved by experiment, it results from a coagulation of muscular albumin. As the fetus is endowed with muscular structure the same as the child or adult, says C. E. Paddock (Am. Jour. of Obstet., August, 1903), it is subject to many of the diseases of later life. Certain of its muscles are subject to constant use for weeks before its birth and are subject to external stimuli. This being so, what reason have we for not believing that rigor mortis exists in the dead fetus? Proof that it does and that it has been recognized for many years has been shown in reported cases. The first reported case was that of of Chowne, Lancet, 1840. In the reported case the cause of death of the fetus may be summarized as follows: In 13 labor was complicated by hemorrhage, viz., in 4 placenta previa, in 8 accidental hemorrhage, in 1 varix. In 2 there was eclampsia and in 5 there was contraction of the pelvis and rigidity of the cervix, in 2 there were twins, and in 1 acute peritonitis, in 1 prolapse of the cord. Granting that rigor mortis occurs in the fetus the question might naturally be asked, How can the fact be explained that the condition is so seldom recognized? In answer to this the author says that often the fetus has gone through the rigid state before birth; again, owing to the feebleness of the muscles, rendered so by disease of the mother or fetus the rigor mortis is too feeble to attract the attention of the physician. Again, the fetus may be born before the rigor mortis commences. In this case the diagnosis of death has been made, and no further thought is given to it. Usually the death of the fetus occurs in the later stage of labor and delivery soon follows instrumentally or normally. Should the condition occur during the first stage or induced by operative procedure the condition is not usually noticed; the physician naturally gives his attention to the living patient, rather than to the dead child. The passage of the child through the birth canal may soften the fetal musculature and joints and so alter the condition, even though it be one of advanced rigor mortis, and it may not again resume rigidity. Cases are reported where the physician has practised artificial respiration on a child, blue and rigid, with the fetal heart beating, although the child was dead and in rigor mortis. The author has heard the fetal heart beat one hour and a quarter after birth, though there had never been any respiration. From a medicolegal standpoint it must be admitted that rigor mortis can occur before birth as well as after. The existence of a new-born dead infant in rigor mortis is not necessarily proof of life apart from a mother, that is of independent existence. It does prove, however, that the fetus was alive shortly before or during birth. Post-mortem changes can thus occur in the dead fetus as well as in the dead adult body and that the condition in each is regulated by the same laws. Furthermore, that the condition often complicates delivery by interference with its normal mechanism.

**Diseases due to Faulty Nutrition.**—The three most marked of these are rickets, scurvy and infantile atrophy, and W. N. Sullivan (Pediatrics, Aug., 1903) assumes that their chief etiologic factor is faulty feeding. Mothers think that the child will grow better if its food is strong, so they give whole milk at an early age, potatoes, meat and other such foods. It is claimed that rickets does not exist in Japan where the fats and oils of fishes and the blubber of whales enter plentifully into the diet. Young monkeys taken from the mothers and fed with vegetables and fruit and puppies fed on

meat develop rickets. Cheadle states that twenty litters of lions died successively of rickets, and the next brood grew up healthy on a diet of cod-liver oil, bones and milk. Milk, however good, unless properly modified, is not always a sound food for the child. Scurvy is most common from the ninth to fourteenth month and lack of fresh food is the most important cause. Proprietary foods and condensed milk produce more scurvy than all other methods of feeding. So-called acute rickets is in most cases rickets complicated with scurvy. Children with scurvy commonly present the following symptoms: anemia, intense pain on motion, spongy and bleeding gums, swelling of the legs. There may be purpura, ecchymoses, discharge of blood from the body cavities or pseudoparalysis. The disease may be confounded with rheumatism, stomatitis, rickets, sarcoma, osteitis and infantile paralysis. Fresh milk, beef juice and orance juice are the most effective remedies. In marasmus or infantile atrophy extreme wasting of all the muscular tissues takes place without, as far as we are able to make out, any disease of other organs. It may be dependent on grave intestinal disturbances of toxic or organic origin; the mucous and submucous tissues of the intestines show atrophic changes. The symptoms are: emaciation, lessened appetite, weak pulse, vomiting. In the ordinary cases a proper diet is soon followed by rapid improvement. Rotch found the most suitable milk one with low percentage of fat, high sugar and medium proteids, with increase of the fat as the infant gains in weight. A fair commencing formula would be fat 0.45, sugar 6.00 proteids 1.00, limewater 5.00.

**Endocarditis Following Diphtheria.**—It is not unusual for cardiac murmurs and an increase of heart dulness to appear in the course of diphtheria, the cause being weakened heart muscle, dilatation and relative insufficiency. In time the muscle recovers and the dilatation and insufficiency disappear. Hibbard detected a systolic murmur in 85 out of 1,052 cases of diphtheria, about 8 per cent. But endocarditis with a valvular lesion is certainly rare. In 220 post mortems of Councilman, Mallory and Pearce, seven cases of endocarditis were found, and in one a pure culture of the Klebs-Loeffler bacillus was obtained from mitral vegetations. Wright and also Howard have reported cases in which the bacillus was found in the endocardium. H. D. JUMP (Pediatrics, Aug., 1903) reports diphtheria in a girl of six years, accompanied by weak and irregular heart. On the seventeenth day she developed fever and a pulse of 120, with a soft systolic murmur at the apex and a sharp second pulmonic. The fever lasted three days and each day the murmur became harsher and louder. A year later at the apex there is a systolic thrill and a loud, harsh, high-pitched systolic murmur. Evidently this was a true endocarditis and not simple dilatation, and its relation to the attack of diphtheria leaves little doubt as to its cause.

## HISTOLOGY, PATHOLOGY AND BACTERIOLOGY.

**Biology of the Dysentery Bacillus.**—D. DOMBROWSKY (Arch. f. Hyg., Vol. 47, No. 3) finds that an amphoteric reaction is most suited for the growth of the dysentery bacillus. There is a remarkable power of adaptability, however, not seen with other pathogenic germs, such as the vibrio of cholera or the typhoid bacillus, and it is very well possible to get an abundant growth with a distinctly alkaline medium. When dried on cover-glasses, the dysentery bacillus will remain alive for from eleven to twenty-three days, depending on the temperature; there was no difference in this respect between cultures forty-eight or seventy-two hours old. In sterilized water, they retained their power of reproducing up to eleven weeks, on bread-crumbs five days and on bread-crust only two days, on potato three days. Skimmed milk proved to be a more suitable medium than ordinary milk. Probably the Shiga and Kruse bacillus are identical.

**Hereditary Cystin Diathesis.**—At the autopsy performed by Prof. Kaufmann of Basle on a 21½-months-old child that had died of gradual inanition, there were found, according to E. ABDERHALDEN (Hoppe-Seyler's Zeitschrift, June 19, 1903) on macroscopic examination of the internal organs, numerous white points which on microscopic investigation appeared as masses of partly round, partly angular plates, which were recognized as cystin crystals. This case was demonstrated by Kaufmann as the first in which an infiltration of the internal organs with cystin has been recognized. This substance was extracted from the tissues by means of ammonium sulphate from which it was isolated in the form of beautiful six-sided crystals. This was actually a case of deposition of cystin in the tissues. Of interest is the fact that in the same family two other children had already died under similar circumstances, one at the age of 9½ months the other at the age of seventeen months. Two male children survived who gave evidence, as examination of the urine testified, of the same metabolic anomaly as the first case cited. On investigation of the urine of the living antecedents of the children, the following results were obtained: Cystinuria was present in the father but not in the mother, and in the grandfather but not in the grandmother on the paternal side. The results of the autopsy on the case cited indicated that the cystin is very probably formed, not in the intestine, but in the tissues, as the result of a quite specific anomaly of the catabolism of proteid. This was confirmed by the following experiment: After all the free cystin had been removed from the spleen, the latter was boiled in fuming hydrochloric acid for six hours. Upon cooling the resulting solution was precipitated by means of caustic soda and allowed to stand for twelve hours. The residue after filtration was dissolved in 10 per cent. ammonium sulphate and precipitated with glacial acetic acid. The precipitate consisted of the characteristic six-sided crystals of cystin. Of greatest interest is the discovery of the progressive family transmission of this anomaly of metabolism. In the case cited the antecedents, both in the male and female side, were tuberculous.

**Destruction of Bacteria in Vaccine Pulp.**—The fact that minute quantities of potassium cyanide added to sea water prevented the growth of bacteria and permitted the delicate eggs of the sea urchin to develop, as shown by the experiments of Loeb, prompted H. R. GAYLORD and D. E. WHEELER (Am. Med., Aug. 29, 1903) to employ it for the purpose of destroying the bacteria in vaccine without injuring the essential organism, which is believed to be a protozoan. They allowed fresh vaccine to become contaminated with putrefactive organisms, and then treated it with varying strengths of potassium cyanide, from n/2000 to n/200. A number of children were vaccinated with this pulp. It was found that a solution of n/200 exerts a complete bactericidal action upon the vaccine without in any way affecting the specific organism. As the cyanide evaporates very rapidly, no toxic effects are possible, especially if the solution be placed in a vacuum pan at 36° C. These experiments also suggest that the organism of vaccine is of the nature of animal protoplasm, and is probably a protozoan.

**Pathology of Smallpox.**—Some interesting contributions to this subject have been made from a series

of five autopsies performed by W. R. STOKES (Bull. Johns Hopkins Hosp., Aug., 1903). Sections and cultures were also made from six non-fatal cases. He believes that the early skin lesions indicate that the primary infection takes place in the lungs, probably by inhalation. The poison when it enters the circulation, shows a selective influence on the epithelium of the skin and respiratory tract, and many cases are probably not further affected. The serious and fatal lesions are caused by the secondary infection from these, and the infectious agent is usually the *Streptococcus pyogenes*. This organism is so distributed through the lesions as to explain most of the visceral changes, such as thrombosis, local necrosis, and the various pulmonary changes. This streptococcus septicemia is the most striking feature of fatal smallpox, and if it were possible to overcome this condition by a special serum, the mortality from the disease would be greatly reduced.

**Accessory Pancreas.**—Seven cases of accessory pancreas were found among a large number of autopsies by C. THOREL (Virchow's Arch., Vol. 173, No. 2). The most usual site is the wall of the stomach and intestine and more rarely the mesentery. The oval, glandular body generally occupies the submucous layer, occasionally the muscular, and causes both an internal and external prominence. Histologically the structure resembles that of the main organ except that the cells are smaller, the lobulation less perfect, the ducts prominent at the expense of the parenchyma and the cells of Langerhans less abundant or absent altogether. Occasionally myomatous new-formation is observed. It is difficult to explain the presence of pancreatic tissue at such abnormal sites, but probably some of the embryonal cells destined to become pancreas were cut off from the rest and displaced by some unknown factor.

**Melakoplakia of the Bladder.**—This name has been applied to a very peculiar and hitherto undescribed condition of the bladder observed by v. HANSEMANN (Virchow's Arch., Vol. 173, No. 2). Studded over the mucous membrane there were a number of round or oval, yellowish prominences, in part ulcerated, in part surrounded by an inflammatory zone. Microscopically they consisted of aggregations of large cells, with peculiar inclusions, which gave the iron reaction. The cells did not seem to come from any of the elements of the surrounding tissues, nor were they looked upon as parasitic by a well-known authority, so that their origin and significance is not clear. The patients did not suffer from any urinary symptoms and had died of some other cause.

**Toxin and Antitoxin.**—The Ehrlich theory of immunity is becoming more and more popular, but an interesting article of M. GRUBER and C. F. v. PIRQUET (Münch. med. Woch., July 14 and 21, 1903) shows that it is really based upon faulty conclusions. There is no experimental proof that a multiplicity of poisons exists with each disease, of qualitatively similar action, but varying toxicity and affinity toward the antitoxin, such as Ehrlich assumed when he formulated his theory of a "poison spectrum." Likewise there is no reason to assume that toxins act differently than other organic poisons. The conversion of a toxin into a non-poisonous "toxoid" with undiminished affinity for the antitoxin is possible, but not strictly proven. Toxin and antitoxin have weak chemical affinities toward each other and in combining they follow the law of other chemical compounds of weak attraction. It is possible that occasionally molecular compounds of varying proportions are also formed. The long period of incubation and other phenomena are best explained on this hypothesis. The formation of antitoxin has nothing to do with toxicity and cell-immunity for (*a*) many innocuous substances can lead to the production of antitoxin; (*b*) animals not susceptible to certain toxins, will yet manufacture antitoxins; (*c*) despite the presence of a large amount of antitoxin, the susceptibility to a poison may still persist and even increase; (*d*) cell immunity can be acquired without antitoxin formation; (*e*) the antibodies are not formed in those organs where the toxin is most active. The specific antibodies are not normal constituents of the body; their production occurs only after the introduction of foreign matter and has the character of an internal secretion. It is due to unknown peculiarities in the molecular structure of this foreign matter. The non-poisonous toxin-antitoxin compound does not lead to the formation of more antitoxin, it is chemically of an entirely different structure than its two constituents.

## OBSTETRICS AND GYNECOLOGY.

**Chronic Inversion of the Uterus.**—The problem of successful reposition of an inverted uterus is almost entirely one of mechanics. According to REUBEN PETERSON (Am. Gyn., June, 1903), treatment must be directed toward increasing the diameter of the inversion ring, either by pressure exerted from within outward or through incision of the pillars of the ring. The following operation is advocated by the author as meeting the requirements of the condition: The inverted fundus is grasped with a volsella and pulled forcibly outward and downward. Another volsella catches the anterior vaginal mucosa in the median line just above the anterior lip of the cup and pulls it sharply upward. Through the vaginal mucosa thus rendered tense is made a transverse incision some 2½ inches in length. In order to avoid opening the bladder, this incision is made as close to the cervix as possible. The vesico-uterine pouch is opened, the cervix exposed and divided between two volsella. This incision is carried upward in the anterior median line of the uterus within one-third of an inch of the fundus. The inversion is now reduced easily, the fundus going upward and each half of the divided cervix being carried through half the arc of a circle and finally meeting so that the two halves form a complete cervix situated downward, not upward. A wedge-shape piece of the bulging uterine wall on either side of the incision is removed, as is suggested by Taylor. This is done to enable the retracted peritoneal edges to come together. The uterine incision is now closed by continuous catgut sutures. The needle was passed from the peritoneal surface down to, but not through, the uterine mucosa. A catgut suture is passed around each round ligament close to the uterus and each end passed through the anterior vaginal wall and tied after the fundus is returned into the pelvic cavity. This brings the line of incision in the anterior uterine wall up against the bladder peritoneum, at the same time giving support to the fundus, which has long been prolapsed. The various vaginal operations which have been advocated for the same condition the author divides into four groups: (1) Partial posterior colpohysterotomy (Küstners' operation), which gave four successes in six operations (Küstner), Perlis (Von Jordon) and two failures (Salin Weber); (2) complete posterior colpohysterotomy (Piccoli's operation); (3) partial anterior colpohysterotomy (Kehrer's); (4) complete anterior colpohysterotomy (Spinelli). The vaginal methods collectively show 26 cases, with only three failures and no deaths, or 88 per cent. successful.

**Tumors of the Round Ligament.**—These neoplasms are comparatively rare, or else operators have been very derelict in reporting them, says D. G. LEWIS (Am. Jour. of Obst., August, 1903). Here, as elsewhere, little is known of the etiology of these growths. Menstrua-

tion provokes a temporary increase in the volume of the neoplasm. We have nothing to make us agree with Sänger that the traction of the displaced uterus may play a causative rôle. To trauma we are not justified in ascribing a causative action. Some of the tumors are situated directly over the external orifice of the external inguinal canal, others at the upper extremity of the labium majus, while some are found where one finds no trace of normal round ligament tissue, *e.g.*, about and below the labium majus. In rare cases the tumors are elongated, cylindrical, taking the form of the little finger. Usually they are single, though they may be multiple. The macroscopical appearance varies according to the histologic nature of the growth. The fibromyoma of the round ligament are like those of the uterus, susceptible of undergoing varied degenerations, benign and malignant. The lipomata present themselves under two forms: (1) When the tumor is developed in the continuity of the round ligament with normal elements of the ligament running through it; (2) when the growth is developed at the expense of the fatty mass of the labium majus. The tumor, usually painless, becomes at the monthly periods the seat of a very sharp pain, which radiates into the corresponding lower extremity, the lumbar region and the pelvis. At this time palpation become painful, and the neoplasm also shows a transitory increase in its volume. In the interval between the periods the tumor is generally painless; sometimes, however, without appreciable cause, little by little, it becomes distinctly painful. To the permanent or periodic suffering we must add the distress, more or less considerable, from walking, in cases where the tumor occupies the labium majus. A tumor of the extra-abdominal portion of the round ligament is differentiated from: (1) an ordinary reducible inguinal hernia of bowel or omentum, or both by the absence of reducibility, impulse on cough and tympany on percussion; (2) from an incarcerated adherent, or irreducible hernia, by absence of impulse on coughing, history of reduction on previous occasions, *e.g.*, before reduction had become impossible, absence of any history of nausea or vomiting; (3) from strangulated hernia, by absence of the above signs, and the grave symptoms incident to all bowel strangulation, shock, increased pulse rate, nausea and vomiting. The prognosis depends upon the histologic structure of the neoplasm. The only treatment applicable to these tumors is extirpation, and this should be done early or as soon as the tumor is recognized. Some operators, after having ligated the round ligament, have simply abandoned it in its place; others have fixed the ligament to the wall of the canal.

**The Present Position of Hysterectomy for Fibroids.**—What has a woman to gain in this operation? says Skewekeith (Am. Gyn., June, 1903). In some cases, nothing at all; in very many, very little indeed. In some a life of comfort and happiness, as against a life of misery; in a few, life inself. In an advanced case of ovarian disease, be the local difficulties what they may, one can honestly encourage a woman to run any amount of risk. She has not much to lose—a few months only, it may be, of everlasting suffering—and she may gain much by an operation, having much to gain. It is quite different in the case of nineteen-twentieths of those who have a simple fibroid tumor. The lists of operations are very unsatisfactory, as there is no standard to go by, and descriptions are so often recklessly indiscrete, incorrect and careless; for example, we find a tumor described as "large," or "the largest I have ever seen." The real reduction in the death-rate has taken place and has been brought about by discarding the clamps, the extraperitoneal operation, and the adoption of the intraperitoneal treatment of the neck of the uterus or complete hysterectomy. It is difficulty, nay impossible, to lay down any positive rule for the performance of hysterectomy, for it is very seldom that it is absolutely necessary to resort to this operation to save life; whereas one must always advise the removal of an ovarian tumor. In the following cases, however, one may say that hysterectomy ought to be the rule: In all fibrocysts, in all edematous tumors when accompanied by profuse watery discharge, in all large tumors causing symptoms, and when a patient is under fifty years of age. Even when a patient is over thirty years it may be worth while to remove a tumor weighing 30 or 40 pounds. In small tumors extending as high as the umbilicus or so, fibrocysts and edematous tumors excepted, the writer, as a rule, advises Apostoli's treatment. This form of treatment does not seem to have been very successful with some. Nor is this to be wondered at if the accounts received from patients treated by others are in any way correct, for it has seemed to resemble Dr. Apostoli's treatment simply in that a battery was used.

**Vaginal Incision in Sepsis Following Abortion.**—The following alarming statements are made by Hunter Robb (Am. Gyn., June, 1903), to the effect that (1) of all married women who die between the ages of twenty and thirty nearly 10 per cent. succumb to a puerperal infection; (2) at the present day, in private practice, at least, the mortality from childbed fever is nearly as high as it was forty years ago. Such a confession is astounding and humiliating, and we must of necessity come to the conclusion that the advantages of aseptic and antiseptic procedures are either chimerical or that the belief in them is still to a large extent more theoretical than practical. So far as the author's own experience goes, the remote results of a septic process following labor or an abortion, implicate more particularly the fallopian tubes and ovaries in 40 to 60 per cent. of the cases. As a rule the infection begins in or near the external genitals. And, provided it is of a virulent nature, it implicates successively the structures of the vagina, the cervix, the uterus and the fallopian tubes, and thus extends to the peritoneal cavity. At other times it reaches the peritoneum through the uterine walls by way of the lymphatics or blood-vessels. Accompanying the inflammation there is often an exudate, which may accumulate in the peritoneal cavity or may remain sealed up in the fallopian tubes. The exudate may be of any form or mixture of forms. If absorption of the exudate does not occur, organization takes place, with the formation of adhesions, which bind down the tubes and ovaries more or less firmly, and thus interfere with their functions. In this way various symptoms are produced which cause the patient a greater or less amount of inconvenience until the adhesions are separated. Under such circumstances we have two problems to solve: (1) How can we insure to the patient the best chance for her life? and (2) How can we, at the same time, prevent the occurrence of unfortunate sequelæ? The author advises the following method of dealing with an infection after an abortion: The cavity of the uterus is first cleaned out to prevent the continued absorption of toxins from any infectious material which may be present, and thus, at least, limit the intensity of the process. For this the finger alone is employed, or combined with the curette. The cavity of the uterus is washed out with hot saline and two ounces of peroxide of hydrogen; it is then cleansed with saline solution and sponged dry. After this two or three drams of iodoform powder are placed into the uterine cavity, which is then packed with sterile gauze. Now the cul-de-sac is freely opened, and after evacuating any fluid

which may be present, it is irrigated with hot saline, followed by two ounces of peroxide of hydrogen. This in turn is washed out and the cavity wiped dry. Lastly, two or three drams of sterilized iodoform powder are dusted into the cul-de-sac, after which it is packed tightly with strips of sterile gauze. By this procedure the author believes that two advantages are obtained: (1) By evacuating the fluid from the cul-de-sac further absorption is prevented; (2) the ovaries and fallopian tubes are saved by preventing adhesions which would almost invariably form as a result of the organization of the exudate. The author's experience has shown that the secretions from the uterine cavity are almost always sterile, while organisms are invariably found in the exudate in the cul-de-sac.

**Peritoneal Adhesions.**—The relation between peritoneal adhesions and the functionating uterus is the subject of a most interesting paper by Chas. B. Reed (Am. Jour. of Obstet., August, 1903). Inasmuch as 80 per cent. (Winckel) of the female bodies which come to the post-mortem table show the effects of peritoneal inflammation in some form, it seems remarkable that cases of function disturbances of the uterus are not more frequently reported. Many factors combine to place the uterus and its vicinity first in point of susceptibility to inflammatory adhesions. Its varied functional activity, its rapid change of form, size, position and consistency—its proximity to organs containing infectious material and the open communication which is afforded by the tubes with the pelvic cavity, and vagina with its manifold possibilities for infection, all unite to produce a predilection for adhesions, which some authors claim as high as 75 per cent. It is a relatively common occurrence to find adhesions between the rectum and uterus and ovaries, which locally produce changes in the peristalsis and nutrition of the rectum, such as catarrh, diarrhea, stricture, coprostasis, and even paralysis, ileus and death. In addition to the general symptoms, there is also to be found locally that all the activities of the uterus are more or less impaired by interfering conditions. It is very noticeable, however, that the functional disturbance is in no way proportionate to the extent of the peritonitic changes, but rather to the anatomical location of the adhesions. The menstrual function may be primarily, seriously involved. Thus a persistent and violent dysmenorrhea is to be found in many cases, where the uterus is bound to the intestine, appendix, omentum or abdominal wall. To substantiate the effect of adhesions as an agent in the cause of sterility, we must appeal largely to theoretical considerations. One etiological factor would certainly be the existence of dyspareunia in the presence of adhesions and inflammatory residues. Adhesions may play an important rôle in the determination of a tubal pregnancy by the construction of the lumen, as in the historical case of the wandering of the ovum, reported by Weber von Ebenhoff, where the right tube was obliterated; the corpus luteum was found in the left ovary and the fertilized ovum in the end of the right tube. The presence of adhesions undoubtedly produces many abortions and influences a certain percentage of fetal and placental anomalies. It is well recognized that sterility and tubal pregnancy may result from such conditions, and it is also probable that pregnancy and labor are rendered pathological by the presence of adhesions far oftener than the literature would indicate. Many adhesions are undoubtedly destroyed by the growth of the uterus in pregnancy, but the rupture of the same may be attended with fatal hemorrhage. Adhesions between the uterus and movable organs of the abdomen are only rarely a source of danger or a cause of death.

## THERAPEUTICS.

**Alcohol Compresses.**—This method of treating local inflammatory processes, first advocated by Salzwedel, has been modified by Beschorren (Deut. med. Woch., 1903, No. 28), in order to avoid the smarting caused by the application. To the alcohol he adds an equal amount of a one-per-cent. solution of aluminum acetate, which raises the temperature of the fluid several degrees and makes it more soothing. The moistened gauze is applied directly over the inflamed area and a piece of rubber tissue, with more gauze over this. A perforated impermeable bandage is then wound around the parts.

**Adrenalin in Typhoid Hemorrhage.**—A severe case of typhoid hemorrhage, occurring in the practice of B. Graeser (Münch. med. Woch., July 28, 1903) was virtually saved by the prompt use of adrenalin. Thirty drops of the commercial solution were given every three hours in physiological salt solution. No ill effects were observed. Although it is improper to judge from one case, the patient had been bleeding steadily with all the other drugs.

**Toxic Symptoms Following the Use of Aspirin.**—Some very strange toxic symptoms were noticed by Franke (Münch. med. Woch., July 28, 1903) after the ingestion of one gram of aspirin. In fifteeen minutes the upper lip began to swell and deglutition became painful, while pulse and respiration was very much increased. The swelling soon extended over the entire head and was not relieved by cold applications. Somewhat later an extremely troublesome urticaria made its appearance over the entire body. The following day all the symptoms had disappeared, and with them the attack of influenza, for which the aspirin had been given. Probably the condition was one of phenol poisoning from splitting up of the drug in the stomach, since the urine contained large amounts of phenol.

**Albuminuria in Aortic Insufficiency.**—Albuminuria is a common condition in chronic endocarditis as soon as there is a disturbance of compensation, which brings with it venous stasis. At first this will disappear with digitalis, but later, when anatomical changes have taken place in the kidneys, no drug will be of much avail. This change of simple congestion to cyanotic induration manifests itself clinically in increased excretion of urine containing albumin, fatty renal epithelium and granular cylinders, while the other symptoms of stasis are relieved or disappear with treatment. V. Leube (Münch. med. Woch., July 28, 1903) classifies the possible causes of an albuminuria as follows: (1) A complicating parenchymatous nephritis may exist, as where the endocarditis is caused by diphtheria. The nephritis is generally amenable to treatment, while endocarditis persists. (2) There may be a general atheroma which also involves the renal vessels, leading to arteriosclerotic kidney. This is especially common with aortic insufficiency. (3) When the energy of the heart sinks and the cardiac muscle undergoes fatty degeneration, stasis, followed by cyanotic induration, is found in all the organs. This occurs only in the later stages of aortic insufficiency. Besides this there is, however, another form of albuminuria, characteristic for the early stages of aortic insufficiency and not accompanied by cyanosis, edema, etc. The urine is not diminished in amount, the specific gravity is relatively low, and the amount of albumin, hyaline and granular casts very slight. Pathological examination of a few kidneys of this kind show that the marked variations in pressure are responsible for certain anatomical changes. The walls of the arteries and capillaries are found much thickened, so that the amount of blood carried to the kidneys must necessarily be less than normal. The liver and spleen show similar lesions, but never the lungs.

# The Medical News.

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## GALL-STONES.

We have had occasion to comment on the truly memorable meeting of the Association of American Physicians, held in Washington last spring, noting particularly the illuminating discussion on diseases of the gall passages and their treatment. One of the most notable papers read at that discussion was that of Dr. C. A. Herter, on the Etiology and Chemical Pathology of Gall-Stones, which is concluded in this week's issue of the Medical News.

While Dr. Herter makes it very evident that there are a large number of unsettled points essential to the full understanding of the many intricate questions relative to this problem, he at the same time gives us an illuminating résumé of the solid grounds for reasonable deductions, and a noteworthy series of suggestions as to the most fertile fields for future investigations.

That all gall-stones are not alike is very manifest, and that pathology in future must differentiate between the modes of formation of cholesterin stones and bilirubincalcium concretions is imperative. Moreover, a careful study of this paper will tend to show that the problems are not as easy of solution as our text-books have led us to believe.

Stagnation of the bile—bilious diathesis, torpid liver, and similar delusive terms receive somewhat of a setback as we read that mere concentration of the cystic contents has probably little to do with the production of gall-stones, of either variety, and that retardation of the flow of the biliary secretion probably must be associated with other factors, notably cystic infection, in order that the train of circumstances leading up to calculous formation may become operative.

The antiseptic qualities of the bile, so dearly loved by those of a teleological cast of mind, are probably non-existent, and interference with the free flow of the liver secretion seems to offer just the opportunity for the ubiquitous bacterium.

Dr. Herter tells us further that there is a tendency, perhaps, to exclude from the mind other than the bacteriological features concerned in the formation of gall-stones, now that in recent years so much important verifiable research has been conducted along the line of cystic infection. While it may be true that infections from a number of organisms may play very large, maybe the most important rôles, metabolic factors should not be lost sight of. His suggestions relative to the problems of excessive fat diet we believe are of far-reaching importance and promise much for the investigator.

Summing up, he says: "It is plain from what has been said that there is at present no unequivocal evidence that gall-stones arise from constitutional derangements unconnected with microorganic invasions of the gall-bladder. On the other hand it is certain that the cholesterin of the bile can be considerably increased by local irritants unconnected with infection and it is likely that the requisite local conditions for such increase sometimes arise through purely metabolic disorders. While gall-stones are commonly the result of local infections we should carefully guard against the conclusion that they can never have a diathetic origin. It is at least highly probable that diathetic conditions are capable of so altering the composition of the bile as to materially favor the production of calculi in the presence of suitable local bacterial activities."

We trust that Dr. Herter may be permitted to continue his studies along this line, feeling that his work on therapeutics will open up a new vista in the purely medical treatment of gall-stones.

## THE WIDENING ROLE OF INFECTION.

There are not a few medical men who have been thoroughly persuaded for some time that the applications of bacteriology to medicine were

at an end and that far from further specific microbic disease agents being discovered there would be a reaction that would make bacteriology of much less importance in the science of medicine than has been hitherto supposed. As a matter of fact, however, each succeeding year brings new diseases within the scope of bacteriology and is making it ever clearer that the study of minute life holds the mysteries of disease that have thus far proved so hopelessly puzzling. There are very few general practitioners now who are not distinctly of the opinion that rheumatism is an infectious disease due to a microbic cause even though up to the present time none of the micro-organisms found in tissues affected by the disease have been proven to be the specific cause of rheumatism.

After all, since the demonstration that pneumonia is due to a specific bacterial agent, it is not a matter for surprise to find that other affections, supposedly dependent on variations in temperature, or on dampness and exposure to cold, are really due to the fact that specific microbes find favorable opportunities under such conditions of exposure to obtain that hold upon the tissues which enables them to produce their serious effects. It seems very clear now that the various forms of colds that is, the various catarrhal conditions which so frequently follow exposure to unexpected changes of temperature, will eventually prove to be due to a number of differing forms of bacteria. Each successive winter with its stock of clinical and bacteriological observations apparently brings us nearer to the acceptance of this conclusion.

In another and quite different line, the rôle of infection is becoming equally important. Many skin lesions have proved to be due to bacteria of various kinds, although in the beginning of bacteriological work in dermatology there seemed to be very little hope that specific causes for cutaneous diseases would be found. The fact that individual reaction is so important in cutaneous disease seemed to point to the conclusion that not specific causes but altering natural conditions were the etiological agents. At the present time, however, the importance of bacteriology in this department of medicine is very generally recognized. In the familiar disease baldness, Sabouraud's observations seem to show the almost constant presence of a specific microbe in all cases of ordinary premature baldness. Even the remote conclusions that flow as corollaries from Sabouraud's teaching present little difficulty to many minds. Not only the infectiousness of baldness, but its possible contagiousness is urged by many.

With these extensions of the doctrine of the bacterial origin of still further diseases in mind, it is not surprising to find that in the nervous system, too, the rôle of the bacteria is coming to be recognized as an important etiological element in the production of disease. Such a condition as myelitis is frankly conceded as secondary in most cases to some infective process in other organs. Even an ordinary furuncle may under unfortunate circumstances prove a source of infectious material that by its ravages in the central nervous system may prove fatal or leave the patient a hopeless paralytic. Supposedly functional nervous diseases are yielding to the same etiological explanation and so it is not a matter for surprise to find that in the discussion of chorea at the recent meeting of the British Medical Association many good authorities did not hesitate to express the opinion that it is an infectious disease, very probably due to a specific bacterium. There are even investigators who consider that they have isolated the bacterium in question. As there is a manifest relationship between rheumatism and chorea this conclusion in the light of recent alterations of opinion with regard to rheumatism might almost have been expected. It is evident that there is still a rich field open for bacteriological investigators and discoveries of importance lie only just behind the veil.

## ECHOES AND NEWS.

### NEW YORK.

**Hospital Cornerstone Laid.**—The cornerstone of the new building for St. Mary's Hospital in Jamaica was laid last week by the Very Rev. Mgr. McNamara, Vicar General of the Diocese of Brooklyn. The hospital building when completed will accommodate about 300 patients. The institution, which now has rather cramped quarters, is conducted by the Little Sisters of the Order of St. Dominic.

**Trachoma Campaign.**—Dr. Lederle has caused a circular letter to be mailed to the board of directors of every hospital and dispensary in the city, asking the cooperation of each institution in the efforts to stamp out trachoma in the public schools. Dr. Lederle proposes to apportion the school children needing treatment in the various districts among the several dispensaries, the pupils being claimed as patients of the dispensaries nearest their homes. He asks that careful record be kept of each child's attendance for treatment, in order that the Health Board inspectors may keep the children under close surveillance. Dr. Lederle's three most important requests are: To permit this Department to print the name and address of your institution on the back of cards given to children excluded from school, in order that those living in your neighborhood may attend your institution for treatment. To

request the surgeon in charge of your eye department to stamp the date of each visit made by a school child on the back of the card given to the child by the inspector for this purpose, in order that the inspectors may be assured that treatment is being regularly attended to. Date stamps will be furnished by this Department on application. To refer cases requiring operation, if you so desire, to the hospital organized for this purpose by the Department of Health. Upon a chart in the office of the President of the Health Board is marked with colored pins the location of all the dispensaries and public schools. Close watch will be kept upon reports for results of the new scheme, and, if this fails, other and more vigorous means for treating school children for the eye disease will be put into operation.

**The Health Board and the New Regime.**—The conditions which existed under Col. Mike Murphy and John B. Sexton, the Tammany Commissioners of Health, are compared with the new order of things under Ernst J. Lederle, the present Commissioner, in a pamphlet issued last week by the Citizens Union. Smallpox reached the high-water mark in the autumn of 1901, under Tammany, but as a result of 810,280 vaccinations in 1902, only 44 cases have been reported this year and but 3 deaths. A decrease in the number of deaths from consumption is also credited to Fusion. The document says: Out of 70,720 deaths in Greater New York in 1901, 8,135 were due to consumption. No strong measures were being taken to stamp out the disease. In 1900 the deaths had numbered 8,154. Under Dr. Lederle in 1902 the deaths were reduced to 7,569, a death rate of only 2.03, against 2.30 in 1901 and 2.37 in 1900. The Department is now planning, in cooperation with the Board of Trustees of Bellevue and allied hospitals, a municipal sanitarium outside the city, to cost $500,000 and to be under the charge of the trustees of Bellevue and allied hospitals. Although the plan has not yet come formally before him, it is understood that the Mayor will sanction it. A dispensary for tuberculosis treatment is now building next door to Department headquarters. The article says that people who came off North Brother Island during Tammany control declared that it was worse than the Black Hole of Calcutta. It adds: It has been evident for years that North Brother Island has been a name to be dreaded by the poor of this city. The rich who were attacked by contagious disease could be properly isolated and treated at their homes, but the poor people were carted off to North Brother Island and there, according to popular tradition, ill treated, half starved, and neglected. This tradition had the result of teaching the poor to conceal the presence of contagious disease among them rather than run the risk of having members of their families taken away to the island. Since January 1, 1902, the Department has spared no effort to eradicate this belief. This has been done, first, by putting the medical corps and superintendence of Riverside Hospital into competent hands, so that patients should have the best of medical attention, food, and general treatment. To add to the comfort of patients, a telephone system was installed in all the pavilions, so that friends of patients might have communication with them at all times in case of necessity, or when it was felt that messages from home might help the progress of the patient toward recovery. Visiting days were also established for the friends of patients, and the means of communication with the island were improved, so that there should be no reason why, within the limits of safety from contagion, North Brother Island should not be as freely visited as any other city institution. All this appears to have had a good effect, for patients have gone back to their friends and told them that the commonly expressed fears regarding the treatment there prove now to be baseless. The concealment of contagious cases has now almost entirely ceased. A death rate of 18.75 in 1902 was a saving of 4,500 lives, the report says. For 1903 the death rate is likely to be 18.

**Memorial Hospital Sold.**—The Memorial Hospital for Women and Children, Classon and St. Mark's avenues, Brooklyn, was sold under foreclosure proceedings in the Brooklyn Real Estate Exchange last Tuesday. The Dime Savings Bank had a mortgage of $50,000 on the property under date of June 7, 1895. The hospital authorities were unable to pay the interest, which was in arrears for several years. There are several other claims against the corporation. Clifford S. Kelsey, who, it is understood, acts for the Jewish Hospital Society, of which Abraham Abraham, of Abraham & Straus, is president, bid it in for $96,500. Mrs. Jennie V. H. Baker, chief of the medical staff of the Memorial Hospital, said that the property had been purchased by the Jewish Hospital Society.

## PHILADELPHIA.

**Under Water Five Minutes.**—To settle a dispute, George Kistler, swimming instructor at the University of Pennsylvania, recently remained under water five minutes and five seconds. It is stated that an examination by a physician following the feat showed no departure from the normal except some acceleration of the heart's action.

**State Homeopathic Medical Society.**—The Thirty-ninth annual meeting of the Homeopathic Medical Society of the State of Pennsylvania was held at Scranton September 22, 23 and 24. The program included a wide range of topics which were discussed by the leading homeopathists of the State. The meeting was held under the presidency of Dr. O. S. Haines, of Philadelphia.

**Columbia's New Hospital.**—The new hospital at Columbia, Pennsylvania, built and equipped at the cost of $40,000, has recently been formally occupied. The building is of Columbia brick ornamented with Indiana limestone. It is three stories high with a frontage of 88 feet. It consists of a main central portion with a wing on either side and an annex in the rear of the central building. The citizens of Marietta contributed $1,000 toward the erection of the building, in recognition of which a portion of each public ward has been named the "Marietta Section."

**Jewish Hospital Improvements.**—Three new buildings, which have recently been added to the Jewish Hospital, are to be dedicated on October 4. They are the Guggenheim Hospital for private patients, the Eisner home for nurses, and the Loeb operating building. The first of these will accommodate 40 patients. The nurses home is a three-story building with accommodations for 35 to 40 nurses. The Loeb building contains an operating room 16 by 24 by 15 feet in size.

**Vaccine Physicians will Examine Pupils' Arms.**—The Board of Education has granted authority to the vaccine physicians of the city to visit the public schools and examine the arms of the pupils to determine if they possess good vaccination marks. Under the instructions issued, the vaccine physicians are not permitted to vaccinate any of the

children in the schools. When it is found that revaccination is necessary, the pupils are directed to so inform their parents, and will not be permitted to return until the operation has been performed, and been successful.

**Typhoid Fever Traced to Milk Supply.**—Infected milk and defective sanitary conditions and not an impure water supply are shown by Chief Abbott, of the Bureau of Health, to be the cause of the numerous cases of typhoid fever reported during the past few weeks from the Twenty-first Ward, where only filtered water is furnished. Dr. Abbott in his report says that the conclusion reached is, in brief, that the unusual number of cases of typhoid fever in the Twenty-first Ward is not due to the water supply, else there should be a corresponding increase in the Twenty-second Ward, receiving essentially the same supply. This is not the case. All the accumulated evidence points to the accidental infection of two milk supplies as the probable cause of the sudden outbreak and, finally, that unless certain defective sanitary conditions now existing in the ward be corrected, we may look for a repetition of this accident in spite of the fact that the population of those two wards is receiving a water supply of the very best grade. The official records of the bacteriological analysis of these waters made at brief intervals during the last six weeks or more point to nothing that would suggest the water in any way at fault. The investigation of the milk supply showed that of the 78 cases of typhoid fever in the Twenty-first Ward occurring since August 1, 41, or approximately 53 per cent., were found to have purchased their milk from a single dealer. Two cases of typhoid fever are known to have developed in this household. As milk is one of the best vehicles for the conveyance of typhoid fever infection, it seems fair to suspect that the disease in the ward in question is due to the use of milk that was in one case accidentally infected by the dealer in whose family the disease existed. As to the general sanitary condition of the neighborhood, Dr. Abbott says, that a "careful survey of the neighborhood reveals the fact that many of the properties have no connection with the street sewers, their facilities for drainage and disposal of waste being over the surface and into the cesspools located in the back yards. There is conspicuous lack of sewage facilities in the Twenty-first Ward. A number of streets have no sewers under them and a very large number of houses located in many instances on streets having sewers are not connected. With the continuation of a condition of this kind, it is obvious that we must anticipate from time to time such epidemics as the one now engaging our attention.

**Phipps Institute.**—The Henry Phipps Institute for the Study, Treatment and Prevention of Tuberculosis has arranged for the coming fall and winter a series of lectures by well-known physicians on the various phases of tuberculosis. Some of these lectures will be more or less popular in character and all will be free to the public. The Auditorium of the Witherspoon Hall at Juniper and Walnut streets, Philadelphia, has been selected for the purpose, having a seating capacity for nearly 1,200 people. The first of these lectures will be given by Dr. E. L. Trudeau, of Saranac Lake, N. Y., during the last week in October, his subject being "The History of the Development of the Tuberculosis Work at Saranac Lake." The following gentlemen have been invited to give the subsequent lectures: Dr. Pannwitz, of Germany, in November; Dr. William Osler, of Baltimore, in December; Dr. Calmette, Director of the Pasteur Institute, at Lille, France, in January; Dr. Herman M. Biggs, of New York, in February, and Dr. Maragliano, of Italy, in March. All of them have accepted with the exception of Dr. Calmette, who will come, if it is possible for him to leave his work in connection with his Institute, and the International Congress on Tuberculosis, to be held in Paris in 1904. Subjects and exact dates will be announced as soon as possible. The Director and members of the staff of the Henry Phipps Institute extend a most cordial invitation to the profession in general to attend these lectures. It is greatly desired that this inaugural series of lectures will prove a success and be largely attended.

The following additions to the staff of the Henry Phipps Institute have been made: Dr. M. P. Ravenel has been appointed Assistant Medical Director and Chief of the Laboratory; Dr. E. A. Shumway has been appointed Ophthalmologist, and Dr. J. F. Wallis has been appointed Dermatologist.

## CHICAGO.

**Superintendent of Compulsory Education Censured by Health Department.**—The Health Department characterized the recent attempt of the Superintendent of Compulsory Education to operate a special health department, as "meddlesome, mischievous and sensational." Among other things, the Bulletin says: "Physicians of Chicago, school principals and teachers and parents of school children are officially notified that they are not required, either by State law or city ordinance, to report cases of contagious disease, suspected or actual, to any authority except the contagious disease division of the city health department. This public notice was made necessary by a renewal of the efforts of the Superintendent of Compulsory Education of the school board to operate an independent health department of his own. His motive is no doubt a laudable one, and if his efforts were guided by a moderate degree of professional intelligence and qualification for the work, they might be beneficial instead of detrimental."

**Physicians Register.**—The 1903 "Report on Medical Education" of the Illinois State Board of Health will be issued in about two weeks. This report includes an official register of physicians, corrected to September 14, 1903. Illinois physicians who desire a copy of the report should write to Dr. James A. Egan, secretary of the State Board of Health, Springfield.

**Appointment of Dr. Halstead.**—Dr. A. E. Halstead has been appointed attending surgeon to St. Luke's Hospital.

**University Buys Dental College.**—The absorption of the Chicago College of Dental Surgery by the University of Illinois has been consummated. Dr. Truman W. Brophy, the present Dean of the Dental College, will be retained in that capacity. The University has purchased the building and all the college property outright. It is said that 800 students are enrolled in the Dental College for the next term.

**Hospital for Contagious and Infectious Diseases.**—It is said, upon what appears to be reliable authority, that Rush Medical College has in contemplation the establishment of a hospital for the care of persons suffering with infectious diseases. This is to be one of the benefits, according to the present plan, which will come to Chicago as a result of the money set aside by John D. Rockefeller for the furtherance of the study of this line of medical

science. The need of such an institution is urgent. According to Chief Medical Inspector Heman Spalding of the City Health Department, there is insufficient accommodation for this class of patients, and as a result the infection is far greater than it should be. For years Dr. Spalding has urged the necessity of the establishment of such institutions, but the Council has failed to make appropriations because of the financial condition of the city. In only a few of the hospitals are the milder forms of contagious diseases treated. The Presbyterian Hospital has arrangements for the care of a few and the County Hospital cares for a limited number. Smallpox cases, however, are all cared for at the isolation hospital, but it is the other forms of infectious diseases that give the health department the greatest concern because of the lack of facilities to handle them. Physicians interested in this matter have urged the Rush College and University of Chicago authorities to agree to take the matter up and establish three hospitals for this class of patients, one in each of the divisions of the city where they would be easily accessible.

**Dr. Lynch Accepts a Position in the University of Chicago.**—Dr. Frank W. Lynch, associate in obstetrics at the Medical School of the Johns Hopkins University and for two years resident obstetrician in the hospital, has resigned to accept a position in the University of Chicago. Dr. Lynch took his collegiate degree at Adelbert College in 1895, and finished his medical education at Johns Hopkins. He graduated in 1899 and it is said that his promotion in university and hospital work since that time has been rapid.

## GENERAL.

**Library for the Blind.**—Under the auspices of the royal oculist Theodor, Duke of Bavaria, a committee has been formed for the purpose of creating a library for the blind in Hombourg.

**Prophylaxis of Leprosy in Indo-China.**—By a recent edict of the Governor General of Indo-China, lepers are forbidden to appear upon the public streets; and infraction of this law subjects them to arrest and transportation to the hospital for lepers on the island of Cu-lao-Rong.

**Oral Hygiene.**—The following action of the National Dental Association, at the recent meeting, held at Asheville, N. C., was taken: "Resolved, That it is the sense of the 'National Dental Association' that each Medical College in the United States should include in its curriculum a lectureship on 'Oral Hygiene, Prophylaxis, and Dental Pathology.'" The dental profession feels that with the introduction of the teaching of Oral Hygiene in the Public Schools, which they are striving to accomplish, and the cooperation of medical men who have been specially instructed on this subject, that a great stride will have been made toward the prevention of caries of the teeth, not to mention many other good results to the general system, which would surely follow a better care of the oral cavity.

**Diphtheria Antitoxin in London.**—By the use of the antitoxin treatment in diphtheria cases, of which there were 6,500 last year in the London hospitals, the death rate from the malady has been reduced in a few years from over 30 to 11 per cent.

**Medical Lecture Course.**—The directors of the Memphis Medical College have established a lectureship, named in memory of the late William E. Rogers, M.D., founder of that institution. The lectureship was established upon the suggestion of the faculty. Once during each session a lecture will be given by a specialist in some branch of medical science, at the invitation of the faculty. The first lecture will be given about the middle of November by Dr. Charles H. Hughes, of St. Louis.

**New Medical School Buildings at Chicago University.**—One of the most extensive real estate deals in the history of the city has practically been completed for the University of Chicago. The transactions involve the purchase of the entire south frontage of the Midway Plaisance between Cottage Grove and Madison avenue, at a total consideration estimated at $1,000,000 for the land and $450,000 for the buildings. The news of the extensive purchases confirms the reports which have circulated in university circles for some time that the medical school buildings are to be established on the Midway. Rush Medical College will form the nucleus of the institution, and it will be supplemented by the McCormick Memorial Institute for Infectious Diseases, for which extensive hospitals may be constructed on the "cottage" plan. Possibly the Chicago Polyclinic Hospital may be included also.

**Malarial Fever at Santiago.**—The unofficial reports current some time ago that yellow fever was prevalent in the vicinity of Santiago has led to special efforts on the part of the Public Health Service to get at the truth in regard to the epidemic in that quarter. The latest official reports received yesterday state that there is no reason for modifying the first diagnosis of the disease. It is malarial fever of a most pernicious character. Its worst extent appears in and around Daiquiri. The public health advices say that in some measure the facts bear out the unofficial statements that have been circulated regarding the disease. Acting Assistant Surgeon Wilson, at Santiago, under date of Sept. 5, describes the malady in detail. It attacks persons who have suffered several attacks of intermittent malarial fever. It is accompanied by vomiting, the body of the patient turns yellow, and cases not treated the first twelve hours are always fatal. The disease is spreading among the natives and all classes of residents. There have been a number of deaths. Yellow fever is officially reported at Monterey and Nuevo Laredo, Mexico. Great precautions against this disease are being taken along the Texas border. Acting Assistant Surgeon Hamilton, at Laredo, under orders from Surgeon General Wyman, is cooperating with the State health authorities. Tentage and camp equipage for 100 people have been sent to Laredo by Surgeon General Wyman.

**Bacteria as Purifiers of Sewage.**—At a recent meeting of the British Institute of Sanitary Engineers, held at Wolverhampton, England, a paper prepared by Dr. J. C. Thresh and Martin Priest, on the distribution of sewage on bacteria beds was the principal subject for discussion. The writers pointed out that it was now generally admitted that in the processes of sewage purification bacterial action was the most important factor and that the condition and quality of a sewage effluent would vary according to the different bacterial influences to which the sewage had been subjected. From the point of view of sewage purification, bacteria were divided into two classes, viz., anaerobes and aerobes, the anaerobes producing putrefaction fermentation, while the aerobes produced the true putrefaction, and it was the aerobic bacteria that they must chiefly endeavor to cultivate and employ in their sewage schemes. If bacterial treatment was the main factor in sewage purification, the proper utilization of the bacteria beds was the crux of the whole problem. The best means for the distribu-

tion of sewage on bacteria beds were: First, the so-called contact beds, in which the beds are filled with sewage, allowed to stand a certain time, then run off, and the beds allowed to aerate; second, distribution by means of alternating siphons, with or without arrangements for distributing the sewage over the whole surface of the beds; and, third, the continuous, or sprinkler system. Many installations of the contact system for some reasons had not proved satisfactory. As regards aeration, the contact beds compared very unfavorably with the sprinkler bed; because, while the contact bed is alternately filled and emptied, the continuous, or sprinkler, bed worked under constant aerobic conditions, with always an ample supply of oxygen. In conclusion, the writers pointed out that the bacterial system of purification merely improved the sewage from a chemical standpoint, and left it nearly as impure as before from the bacteriological standpoint, and possibly, therefore, quite as dangerous, so far as disseminating germs of typhoid fever, cholera, and other water-borne diseases were concerned.

**Purification of Water by Ozone.**—At Wiesbaden and Paderborn in Germany good results are said to have been obtained in the purification of water by the use of ozonized air, water of an inferior quality having been turned into very good drinking water. The plant at Wiesbaden contains 48 ozonizers, forming duplicate groups of twenty-four each. A set of eight ozonizers receives an alternating current of 8,000 volts from a step-up transformer. One pole of the apparatus consists of the cooling water of the glass tube, and is earthed, while the other pole, connected to the transformers, is placed in an inaccessible position, and therefore causes no danger to the attendant. The ozonizing tubes are enclosed in a cast-iron case consisting of three parts: (1) A completely closed central portion, into which are firmly screwed the eight ozone tubes; (2) an upper part, acting as a reservoir and distributor of the air, and (3) a lower part, forming the ozone-collecting chamber. In the upper chamber, removed from all possible touch of the attendant, are fixed the terminals from the transformers. On the floor of the lower compartment are placed the high potential cylinders with their insulating glass rods, and in addition an automatic device to prevent a short-circuit through any leakage of the cooling water. This consists simply of a strip of filter paper stretched across a metal spring. If the filter paper gets moist it tears, the spring opens out and automatically puts that particular ozonizer out of use.

**Medical Service in Battle.**—The tactical lessons taught by the Spanish-American and the Boer wars have been much discussed, and these have suggested another question intimately connected with the tactics of the situation, and the solution of which is entirely dependent on these tactics, namely:

"What," writes the *Sun*, "have these wars taught as regards the medical service on the battlefield? In view of this intimate connection between the two, it is evident that the medical service should profit by the lessons learned in tactics, and regulate its work on the battlefield accordingly. The battles before Santiago, fought with small caliber rifles and smokeless powder, furnish no connected data for practical use in making tactical deductions; all considerations of the subject were more or less theoretical. But the Spanish-American, and more particularly the South African war helped to solve the problem. The American army was the first to make an attack on a battlefield which had no curtain of smoke to furnish cover or to mark the enemy's line and to advance against small caliber repeating rifles. The campaign was short, however, and the conditions limited, consequently the Spanish-American war furnished merely the initial data, while the South African war, with its great numbers, its variety of conditions and its examples of important battles, furnished a mass of material for the new tactics.

"A study of the experiences in these two wars shows that there are three principles of tactics developed by them which bear on the medical service in the field: 1. The movements of the attack have become much slower. 2. To obtain superiority of fire it has become necessary to remain much longer in the firing positions. 3. The battle begins at much longer ranges, and serious wounds are produced at far greater distances than formerly. All these affect the location of field hospitals, etc., and the work of the medical officer on the battlefield at various stages of the battle. The first is explained by the accuracy of the modern arm, the lack of cover to the attack, formerly furnished by the cloud of smoke, but above all by the invisibility of the enemy. As a British officer graphically expressed it: 'In a modern battle what affects the assailant most seriously is the emptiness of the battlefield.' The second principle results from the first, but has its own explanation, too. Superiority of fire depends on the relative effects on both sides, and, in spite of all improvements in firearms, it takes much longer now to gain superiority of fire, because of the great losses in the open; consequently, the attacking force must stay longer in its successive firing positions (under cover) before it can hope to advance to the next one. What requires but a few minutes in peace maneuvers will demand hours in time of war. The third principle results from the greater power of the modern arm. The successive firing positions will be the places where the wounded will accumulate, and there the surgeons will be particularly needed. But they will be in demand even at great distances, for target practice experience shows that at 1,000 yards a line of skirmishers can in five minutes put 35 per cent. of a similar line out of action, and, although the losses at this range, as shown in the last two wars, were less than this, they were still serious. As the ranges decrease the destructive effects rapidly increase. At 800 yards the cranium is perforated; at 500 yards the long bones are broken into pieces as small as a pea, and the adjacent muscles are torn away; and at 400 yards blood vessels are pierced or particles are torn from them, causing grave hemorrhages, often proving mortal. To avoid the moral effect of so many wounded the medical attendants must advance with the line to give aid. They can no longer remain beyond the zone of fire, but must go where they are needed. But it is evident that this corps cannot perform its work on the line of skirmishers, except during the pauses in the battle or when the objective of attack is changed. The troops themselves must therefore act on the line of skirmishers while the firing is going on, and for this purpose they are provided with their first aid packages. If any cover is available near the line the wounded will instinctively seek it, and there, too, the medical corps must come into action. These improvised stations can render provisional service, but they must be in communication with the field hospitals in rear, and the latter must be carefully selected for that reason. Cover is the main thing at first, and water, straw or bedding are secondary con-

siderations. In the Franco-Prussian war such cover was often found at 600 yards behind the principal firing line, but the modern gun has a much flatter trajectory than the needle gun of that day, consequently the protecting cover can be much lower. At 600 yards the projectile rises but 8 feet above the line of sight, and at 1,000 yards only 33 feet. For these reasons medical officers must be carefully trained in time of peace promptly to select proper cover for their stations near the troops, and must be in touch with the tactical situation in war in order to effect this intelligently. The slightly wounded must be rapidly transported to the rear, for it is a well-known fact that many of the wounds of the small caliber bullet heal rapidly; therefore the enemy will make every effort to capture the stations where they accumulate, in order to prevent their returning to the ranks in the near future. It is evident, therefore, that under the new conditions the medical officers must acquire a general knowledge of tactics, and in a battle must be informed of the general tactical situation, and they must also familiarize themselves with the proper use of cover. Their stations must be close up to the firing line and must be moved to the front continually in order to take proper advantage of the pauses in the battle. The most advanced stations will be improvised and will be determined by the troops themselves—the dead angles or places under slight cover, to which the wounded have crawled of their own accord. The others must be selected with reference to cover alone, and must be connected with the field hospitals arranged in rear and out of the limits of the zone of fire."

**The International Association of the Medical Press.**—A meeting of the Committee of the International Association of the Medical Press, writes the *British Medical Journal*, was held at Brussels on September 1, in one of the Committee rooms of the Belgian House of Representatives. The following countries were represented: Spain, Dr. Cortezo (President) and Dr. Monmeneu; France, Drs. Granjux and Blondel; Belgium, Dr. Déjace; Norway, Dr. Aaser; Denmark, Dr. Caroë; Portugal, Dr. Silva Carvalho; United Kingdom, Dr. Dawson Williams and Mr. Adolphe Smith. Regulations for the conduct of the business of the Committee were adopted, and it was resolved to bring the existence and aims of the Association under the notice of the editors of the principal medical journals in America, North and South. Applications were received from the directors of medical journals in Holland and Hungary, and the Committee decided to invite these gentlemen to take steps for the formation of national associations. The question whether a congress of the medical press should be held in Lisbon immediately before the International Medical Congress to be held there in 1905, or whether the Congress should be replaced by a general meeting of the International Association was considered, but a decision deferred until the next meeting of the Committee.

**Obituary.**—Dr. S. S. H. Stout is dead at Clarenden, Texas, at the age of eighty-two years. He was a native of Tennessee and served through the Civil War as Director of the Medical Department of the Confederate Army. Dr. Stout was graduated from the University of Nashville in 1842 with the degree of A.M., and in 1848 from the University of Pennsylvania with the degree of M.D. The honorary degree of LL.D. was conferred upon him at the University of Nashville in 1885.

Dr. Egbert Guernsey, the eminent homeopathic physician of New York, who died at his summer home in Fishkill Landing, N. Y., last Saturday, was born in Litchfield County, Conn., on July 8, 1823. He was educated in Phillips Academy, Andover, the Yale Scientific School, and the Medical College of the University of the City of New York, from which he was graduated with the degree of M.D. in 1846. Instead of beginning practice, he started the newspaper now known as the Brooklyn *Daily Times* and then as the *Williamsburgh Times*. While editing that paper he prepared two school histories of the United States, which were widely adopted as text-books. In the spring of 1849 he was appointed City Physician of Williamsburgh, and then began to give his attention exclusively to his profession. In 1850 he established his office in this city. Dr. Guernsey did a wide work in the literature of his profession. In 1855 he published "Domestic Practice," which has passed through eleven editions. He was associated with Dr. A. Gerald Hall in the publication of "Jahr's Manual," and was for years editor-in-chief of the New York *Medical News-Times*, which he founded in 1872. In 1870 he organized the Western Dispensary, which has since been connected with the Hahnemann Hospital, which he also helped to organize. He was also one of the prime movers in the organization of the Metropolitan Hospital, on Blackwell's Island, and gave constant service in the development of that institution. It was through his instrumentality that the old Inebriate Asylum on Ward's Island was converted into the Manhattan State Hospital under the direction of the Commissioners of Charity and Correction in 1877, and he was for many years the President of the hospital. He was for a long time trustee and at one time Vice-President of the State Insane Asylum at Middletown, N. Y., and had been President of both the county and State medical societies. Dr. Guernsey was one of the founders of the Union League Club, and at the time of his death was a member of that club; the Sons of the Revolution, the National Academy of Design, the New England Society, and the New York Historical Society, besides a number of medical and philanthropic organizations.

## CORRESPONDENCE.

### DR. ADAMI AND THE AMERICAN CONGRESS OF TUBERCULOSIS (CLARK BELL).

*To the Editor of the* MEDICAL NEWS:

SIR: Upon my return from abroad a few days ago, I learned for the first time that I had been announced as one of the Honorary Presidents of the American Congress of Tuberculosis (Clark Bell). This announcement had been made without my knowledge and had been communicated to the public press before ever I had been approached in the matter. After that communication (June 11) I find that I was addressed upon the subject (June 12). The notice, which I have before me, is in the form of a copygraph letter upon the flimsiest of yellow paper, dirty and badly folded, and is not to the effect that I had been appointed Honorary President, but merely a curt reference to an enclosed list of officers elected at a recent session, ending with the expression of the hope that I would accept. The enclosure consists of two columns cut out of the New York *Daily Tribune* which, it is true, contains my name (misspelled) on the list of Honorary Presidents. I am not in the least surprised that my First Assistant mistook the communication for a second-class adver-

tisement or something of the kind and never realized that it was matter which should be forwarded.

Under no circumstances would I have consented to allow my name to be connected with the organization in question. The employment of the name as that of an Honorary President is and has been wholly unauthorized and I have written asking that it be withdrawn.

I am, Sir,
Yours faithfully,
J. GEORGE ADAMI.

Pathological Laboratory, McGill University, Montreal, Sept. 18, 1903.

## SOCIETY PROCEEDINGS.

### THE NEW YORK ACADEMY OF MEDICINE.

*Stated Meeting held Thursday, May 21, 1903.*

The Vice-President, Charles L. Dana, M. D., in the Chair.

**Symposium on Puerperal Infection.**—The scientific business of the evening consisted of a series of papers read under the auspices of the Section on Obstetrics and Gynecology. The subject was a symposium on puerperal infection. The first paper consisted of a historical review of the subject by Dr. Brooks H. Wells.

**Amelioration of Puerperal Conditions.**—This paper will be published in a subsequent issue of the MEDICAL NEWS.

**Pathology and Prophylaxis.**—Dr. J. Clifton Edgar presented a paper upon this subject, which will be published in the MEDICAL NEWS shortly.

**Intravenous Antisepsis.**—Dr. Charles C. Barrows reported a series of cases of puerperal fever successfully treated by the injection of one-half liter to a liter of a 1-5,000 solution of formaldehyde. The cases originally reported by him have given rise to an extensive literature of the subject and this he reviewed to some extent. Drs. Park and Payne, of the New York Board of Health, have taken up the same subject experimentally on animals, and have shown that injections of formaldehyde are not curative when there are virulent streptococci in the circulation of rabbits. Dr. Barrows pointed out that rabbits were bad subjects for such experiments, since they did not, because of idiosyncracy, stand formaldehyle injections well, and besides, were especially susceptible to septic conditions. While Drs. Park and Payne's observations deserve the utmost consideration they must be judged only on their merits, and it must be borne in mind that there is no mention of the time allowed to elapse between the injection of virulent streptococci and the use of the formaldehyde solution.

**Exaggeration of Danger.**—A number of personal observations made by physicians shows that the introduction of formaldehyde solution into the venous circulation is not likely to cause serious symptoms. McGuire's experiments, done in London, particularly show that large amounts of formaldehyde may be taken into the system without danger. The cyanosis and syncope which have been reported after some injections may occur after intravenous salt infusion, and are not necessarily due to the formaldehyde. Too many observations have been made now for the objection of danger to have any great weight on the subject.

**Technic of Method.**—The median basilic or cephalic veins are snipped with a scissors in order to make an easy opening for the canula. A longitudinal opening made with a knife is not nearly so suitable for the purpose. Care must be exercised that the canula is not introduced into the sheath of the vein, but this accidental misplacement will be followed immediately by the production of a tumor at the site, and then can be corrected. The solution must be introduced slowly, and the patient's condition should be watched carefully, so as to avoid the production of syncope or any disturbance of the general condition.

**Illustrative Cases.**—Dr. Barrows reported some 14 cases from the practice of friends and brother physicians, an accident to his patella some three months ago having made it impossible for him to continue his observations with regard to it. In one case there was expulsive vomiting, a tender tympanitic abdomen, a temperature of 105° F., with a pulse of 150. This case looked surely fatal, yet after the injection of formaldehyde of 1-5,000, the temperature promptly dropped, and the patient continued to convalesce up to a perfect recovery. In another case a rapid rise of temperature took place on the sixth day after labor, which fell after curettement, but only to rise again this time to 105° F. An intraveneous injection with formaldehyde was given 1-4,000, and this was followed by a chill and by some cyanosis. The temperature fell, however, and rose again the next day to above 105° F., when another injection was given, followed by a drop of temperature without a subsequent rise. In certain cases a solution of formaldehyde stronger than 1-5,000 and even as strong as 1-2,500 was employed with good result. In several cases that yielded very nicely to formaldehyde injections, antistreptococcus serum had been faithfully tried without effect.

**Specific Action of Formaldehyde Solution.**—In a controlled case of puerperal septic fever, in which, instead of formaldehyde solution, normal salt solution was employed, the result was fatal and without the drop in temperature, which so invariably accompanies the injection of the formaldehyde solution. Sajous, in his recent book on the therapeutic action of glandular extracts, suggests that formaldehyde is a stimulant to the adrenal system. He quotes Dr. Barrows' cases and considers that the stimulation of the adrenals causes a distinct and demonstrable rise in the bacteriolytic action of the blood serum and other fluids within the body. To this, in Sajous' opinion, are to be attributed the good results obtained from the formaldehyde injections.

**Frequency of Puerperal Fever.**—Dr. William R. Pryor said that in spite of the discoveries in bacteriology that had made very clear just what the causes of puerperal fever are, quite as many women perish from the disease now as before its pathogenesis was known. It is clear that the affection is really a form of a lymphangitis, and that death is not due so much to the presence of germs in the uterus as to their absorption into the system when they occur in the heart, and even the brain and the kidneys. It is not so much the changes in the blood either that cause the fatality of the disease, and it is never the local lesions. The local lesions may be comparatively insignificant. If there is to be any remedy for the affection it will be found in some substance that will act as an antiseptic, follow the germs and their toxic secretions into the lymphatics and there neutralize them by direct destructive action.

**Bacteria in the Abdominal Cavity.**—By a series of observations made in cases of severe infection Dr. Pryor has succeeded in showing that streptococci are practically always free in the abdominal cavity. In certain cases where there were symptoms of beginning peritonitis in the pelvis Dr. Pryor has opened up and packed the posterior cul-de-sac with iodoform gauze. After such treatment no cocci were found to be present on the second or third dressing, though colon bacilli had found their way through the intestinal walls and were practically always present. The setting free

of iodine in the presence of the tissues, as happens when iodoform is brought in contact with a lacerated surface, or with a serous membrane, is the best antiseptic action that can be obtained, and brings about a rapid drop of temperature and pulse. The evidence of the absorption of iodine is to be found in its presence in the urine, which may usually be demonstrated in five hours and sometimes even in two.

**Danger of Curettage.**—Dr. Pryor thinks that an immense amount of mischief has been done by the use of the curette. Lymphatics that have been closed by nature's processes and are effectually preventing the progress of the septic condition are rudely opened up and made patulous by means of the sharp curette, and as the infected material is not entirely removed this proves a new nidus for infection for further septic processes.

**Results with Iodoform.**—Dr. Pryor has treated some 37 cases with iodine, with but one death. It is important that iodism should be secured, but this may be accomplished effectively even by the use of liberal amounts of iodoform ointment applied externally. Once iodism is obtained, not only is the mortality lessened, but the morbidity decreases very materially, and the convalescence of these cases, usually so tedious and so prolonged, with so many complications and sequelæ, is over in a short time, and patients promptly recover their normal health.

**Condemnation of Curettage.**—Dr. Herman J. Boldt, in discussing the operative treatment of puerperal fever, said that undoubtedly curetting is often a mistake and cannot be too severely condemned. It is only when the condition is due to saprophytic organisms, and not to pyogenic organisms, that instrumental cleaning out of the uterus is justified. On the other hand, repeated intra-uterine irrigation may be easily carried to such an extent as to add distinctly to the danger in milder cases of puerperal sepsis, without any additional safeguard being added adequate to the risk entailed. Minor surgical procedures, which used to be considered favorable in these cases, are now practically abandoned.

**Uterine Extirpation.**—Extirpation of the uterus is so serious a remedy that it can only be thought of in cases of puerperal sepsis, when there is reasonable assurance that the septic condition was limited to the uterus, and when treatment of any other kind has proved to be of no avail. Only in the gravest forms of the affection has it been practised and even then it has proved to give very little satisfaction. Whenever bacteria could be demonstrated in the circulation, the operation has always failed. A number of patients have died after the operation, even when the septic condition seemed limited to the uterus, and when no bacteria could be demonstrated in the blood. The time required for the operation must not be permitted to stand as an objection against it since, under favorable circumstances, the uterus may be extirpated in ten minutes and at times the operation has even been completed in six minutes.

**Bacterial Diagnosis and Its Shortcomings.**—At the present time nothing is more needed than some rapid method of deciding that bacteria are surely present in the blood. Under present conditions of knowledge and technic, at least twenty-four hours is required in order to demonstrate by cultures whatever bacteria may be in the circulation. This is entirely too long, and some method of deciding so important a question, even by a few hours, must be found, if bacteriological diagnosis is to be of real assistance to surgery. There remains the question of the abdominal or vaginal route for operation. The latter should be chosen unless the uterus, as is often the case, proves to be too large for removal in this way. Of course, precautions must be taken that in the removal of the uterus infective material is not spread over other portions of the pelvis. If the broad ligaments are affected, then the operation should be done through the abdomen. Trendelenburg has reported some good results by following this method. If the uterus is large and boggy, then, as a rule, removal should not be undertaken, but the decision must ultimately depend upon the patient's condition.

**Not Treatment but Prophylaxis.**—In opening the discussion, Dr. Egbert Grandin said that he doubts if there has been any sure advance in recent years in the treatment of puerperal infection. Whatever improvement has come has been in the matter of prophylaxis. Otherwise, for twenty-five years, obstetrics has been at a standstill. This has not prevented surgical interference of the most varied kind, however, and undoubtedly harm rather than good has been done, as a rule. Those who have been readiest to interfere actively for the treatment of the condition have been least careful to differentiate the various types of puerperal infection before beginning treatment. The putrefactive varieties of puerperal sepsis are rarely fatal unless the pathological processes in the uterus are needlessly interfered with, nature's protective mechanism broken down, and the resistive vitality of the patient lowered by uncalled for remedial measures.

**Danger of the Curette.**—In 1886 Dr. Grandin read a paper recommending the use of the curette for certain conditions of puerperal infection. Many editors commented upon it, and portions of it, at least, were printed in many parts of the country, evidently attracting a great deal of attention. Undoubtedly, it has been a source of much more harm than good. In the case of retained remnants of the placenta and secundines the curette is not nearly as useful as the finger. The use of the curette opens the lymphatics, brings about the diffusion of septic material, and makes the cure of the condition impossible. The hand will do all that is needed in these cases and without any of the risk of causing damage almost inevitably incident to the employment of the curette. A good general rule in the treatment of these infections is avoidance of local treatment. The less that is done locally the better. The methods suggested by Drs. Barrows and Pryor, by which an effort is made to have an antiseptic follow the infected material into the tissues or neutralize it in the circulation, is undoubtedly the principle of rational therapeutics that will eventually prevail in this matter. The results obtained by them are very encouraging. Yet it must not be forgotten that the severest and most hopeless-looking cases of puerperal sepsis sometimes get better unexpectedly, without the employment of either of the methods suggested, and, in fact, without any treatment at all.

**Operative Interference.**—Whenever there is pus present in the pelvis it should be evacuated. This is the simple rule of all rational surgery. Beyond this, however, operative intervention is almost sure to do harm rather than good. Dr. Grandin confesses to being guilty of having done hysterectomy twice in puerperal sepsis. To be of any avail this should be done very early. As a matter of fact, the time for doing hysterectomy when there is hope of its being successful is so early in a case that there is very little prospect of the operation ever being really undertaken in time. Surgery in puerperal fever has been entirely too radical and too ineffective. What is needed is some agent, such as Dr. Barrows and Dr. Pryor are making their observations with, that will, if possible, follow the streptococci in its invading course to the lungs, the brain, the heart, and the kidneys of the patient.

**Prognosis not Absolute.**—Dr. Henry C. Coe said there is no absolute prognosis of any individual case of

puerperal fever. At Bellevue, as is well known, the worst looking cases, that apparently have come in moribund, sometimes unexpectedly recover. Dr. Coe has seen ordinary intravenous salt solution injections given to a moribund patient, as a last resort, produce a drop of temperature from 104° to 98° F., without producing a chill. The temperature remained down for many hours, and was again lowered by salt solution injection. Hysterectomy is in theory indicated in cases where the localization of the infection is limited to the uterine tissues, but it is practically impossible to obtain an indication for the operation early enough in such cases to reduce the theory to successful practice.

**Prompt Treatment.**—Dr. Simon Marks said that the most important element for the successful treatment of puerperal fever is undoubtedly its early recognition. When the practitioner finds that the temperature has gone up in a puerperal patient, he hesitates to admit that there can be any puerperal infection. Other sources of fever are thought of first and treatment for supposed infection is allowed to drag along for some time. The practitioner hesitates to ask for consultation and the result is that when a consultant eventually is called the woman is usually moribund. There is no doubt that there will be some morbidity from puerperal infection, even in the best hands. If the practitioner is ready to admit this, cases will not be neglected until it is too late. Every case that presents a temperature above 100° F. should be considered serious, and if the uterus is cleared out sufficiently early there will often be an end of the danger.

**Too Much Deprecation of Curette.**—Dr. Marks considers that just as there was an exaggeration in the use of the curette, so now the reaction against its use is going too far. Personally, Dr. Marks does not fear the use of the curette, and considers that in expert hands it is much safer than the finger. Often the cervix is so closed that the finger cannot be inserted, or is not able to reach portions of the cornua of the uterus, which are readily reached by the curette. At times the localization of infectious material seems to be entirely on the inner surface of the uterus where it can be removed. If promptly treated, prophylaxis is, of course, much more important than treatment. Good, ordinary cleansing of the hands of the obstetrician is, however, almost more important than any of the more recently introduced and highly praised methods of aseptics. The use of gloves, for instance, has not given much difference to the morbidity of puerperal patients, as compared with the best results obtained before their use. In some 60 cases delivered with gloves there were some 24 per cent. morbidity.

**Old-time Treatment.**—Dr. S. W. S. Toms, of Nyack, said that there has been very little improvement by the introduction of new-fangled methods of treatment. At Bellevue, in the old days, opium was used freely and the statistics of recovery were quite as good as at the present time. After all, the patient's restfulness in these cases prevents the dissemination of infectious material very probably, and increases vital resistance by lessening fear and anxiety as to the result.

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## MEDICAL SOCIETY OF THE STATE OF PENNSYLVANIA.

*Fifty-third Annual Meeting held at York, September 22, 23 and 24, 1903.*

FIRST DAY—SEPTEMBER 22.

The Society was called to order by the President, Dr. William M. Welch, of Philadelphia. Rev. E. T. Jeffers offered prayer. Hon. M. B. Gibson, Mayor of York, then welcomed the members of the Society to the city. He dwelt on the early history of the town, there now being manufactories instead of the historic buildings of the Revolutionary period when the Continental Congress met on the site of what is now the Colonial Hotel, the headquarters of the Society. The city now has absolutely pure, filtered water, and is soon to instal a sanitary sewage system at a cost of $400,000.

A brief address of welcome was then extended by Dr. N. C. Wallace, President of the York County Medical Society.

The presentation of the program by Dr. I. C. Gable revealed several departures from those of previous meetings. This was the first meeting of the Society held under the new rules, which provide for the transaction of business by an executive council. Advantage was also taken of a recent by-law to hold Wednesday's and Thursday's morning sessions in two sections, this being necessitated by the large number, more than 80, of papers presented. The annual addresses were all given on Tuesday afternoon.

Dr. J. N. McCormick, of Bowling Green, Ky., representing the American Medical Association, was given the privilege of the floor and made a very strong appeal for a more thorough organization of the profession. Up to this time only the surface has been touched. There are probably 120,000 physicians in the United States, and only 30,000 of them are members of any society. A united profession is hindered by the petty jealousies and constant warring of neighboring practitioners, doctors being at peace with every one except their own clan. Malpractice suits are aided in this way and ofttimes necessary surgical work is not undertaken because of fear of the outcome and the stock made of it by fellow physicians. Speaking of handling men who drift into bad methods, Dr. McCormick told of one who, after trying every other means, they made president of a county society. This put him on his mettle and he finally became a respectable practitioner. A valuable feature of organization is the power it gives the older men to watch over the younger ones.

The remainder of the forenoon session was devoted to the reports of officers, committees, etc. The Secretary reported a membership of 3,665, a gain during the year of 145.

**Address in Surgery: The Individual Equation of the Patient in Surgical Operations.**—Dr. W. L. Estes, of South Bethlehem, said that operations themselves give very little concern these days, but occasionally a death occurs when an apparently ideal operation has been performed. Other patients, though outwardly less favorable, get well. These occurrences suggest that there is an average vitality among patients and that this is determined by several factors. These should be carefully studied. Among the conditions that affect the reaction of the individual to traumatism are heredity, environment and habit and the physical condition of the patient. The question of heredity is a complex one as probably no disease other than syphilis is directly transmitted to offspring. But tendencies are transmitted, a peculiarity of cells, a chemical individuality, so to speak. This makes for or against vitality of the patient. Dyscrasias are thus transmitted and low resistances of cells to noxious influences or low power to produce antitoxins result in deaths from low grades of sepsis. Under environment Dr. Estes made a point that is rather opposed to previous beliefs. This was that the baleful effects of bad sanitation are by no means confined to the city and town. Conversely, he states that town or city-bred people stand operations better than do the average farmer. The fresh air and plentiful food of the latter are to a large extent nullified by overcrowding in sleeping apartments and by eating poorly cooked food. The physical condition of

the patient is often the turning point in a case and a thorough examination by the surgeon himself or by a competent aide should be insisted upon in every case. Taking physical examination to include the urine, it is of greater diagnostic value than laboratory methods. But the two should be combined.

**Address in Obstetrics: X-ray Treatment of Uterine Cancer and the Etiology of Eclampsia.**—Dr. John G. Clark, of Philadelphia, reviewed the above subjects. He spoke of the mortality from uterine cancer and the efforts being made in the line of earlier diagnosis. But 50 per cent. of the cases, as seen in a clinic, are already inoperable. Any method that promises results in these cases should be given a thorough trial. The action of the X-ray is still problematical, though it is probable that the healing effect is more in the line of stimulation. No one person has had sufficient experience to be an authority on the effect of X-ray treatment and the opinions of two classes must be combined—those that are skilled in the application of the X-ray and those who observe the preceding and subsequent history of the patient. Dr. Clark has had a limited personal experience in the use of the X-ray, but from it and from a careful review of the literature he draws the following conclusions: (1) No operable case of cancer of the uterus should be temporized by the use of the X-ray; (2) local therapeutic agents are practically valueless; (3) even in inoperable cases there is a very remote hope of cure and there is almost sure to be relief of pain; (4) the X-ray is on a sufficient basis and promises enough that this method of treatment should be thoroughly investigated. The principal point brought out in regard to eclampsia was that recent investigations throw doubt on its origin in the kidney alone, acting rather as a general poison.

**Address in Hygiene and State Medicine.**—Dr. Seneca Egbert, of Philadelphia, pointed out some of the results that have already accrued from recent investigations in these lines and gave a forecast of what may be expected in the future. The paper was largely a statistical collection of facts regarding the lowered mortality of the present as compared with the preceding decade. The agencies of preventive medicine have very largely benefited the people; especially those of cities. Philadelphia and Pittsburg do not show the decreased death rate they should and have been especially negligent in vaccination and the prevention of typhoid fever. The need of educating all the people in sanitation is paramount. State Boards of Health need the unanimous support of the public. The vital statistics recently asked by the government should be rigidly supplied. School children should be taught far more than at present concerning sanitation, quarantine, heredity, environment, need of fresh air, parks, proper occupations, etc. The course in physiology and hygiene should continue until they leave school.

**Address in Neurology: Insanity.**—Dr. Charles B. Mayberry, of Retreat, criticised the treatment of the insane under present methods. All varieties are placed together, though he has never seen good results from contact of patients. The family physician has a great part in preventing insanity. He it is who watches over children during their development and sees the adult before the outbreak of insanity. A history of insanity in the family should cause particular attention to the child or even adult during critical periods of its life. Of 600 admitted cases there was a family history of insanity in 163. Danger signals should be recognized. The present condition in state hospitals tends to prolong attacks of the condition. Dr. Mayberry would suggest: (1) An extended course of instruction in clinical and didactic psychiatry in our medical schools; (2) the erection of small psychopathic hospitals throughout the state for the treatment of acute, curable cases. Pennsylvania would need six of these; (3) with each one of these should be maintained an outpatient department, in order to keep under observation for one year every patient that was discharged; (4) the establishment of a central pathological laboratory for the further study of the condition. It is being more and more recognized that the pathology of insanity is the pathology of the entire body.

**Address in Ophthalmology.**—Dr. E. B. Heckel, of Pittsburg, traced some of the history of this branch which is almost as old as medicine itself. Ophthalmologists have been accused of using the same old drugs—mercury, silver nitrate, and atropine. This is true, but each has undergone marked improvement in the method of use. American ophthalmologists are considered to be the equal, and in some respects, the superior of those of Europe. The relation of the ophthalmologist to the profession and to the laity was discussed. His position in the profession is secure. His standing among the laity will largely depend upon the actions of the general practitioner, as to whether he sends patients to reputable or incompetent men.

**Address in Medicine: Treatment of Pulmonary Tuberculosis at White Haven.**—Dr. H. M. Neale, of Upper Lehigh, gave a description of the methods of feeding, exercise, rest, sun baths, etc., as employed at the White Haven Sanatorium. These are essentially the same as those which appeared in the MEDICAL NEWS a few weeks since.

**Is There a Medical Profession?**—Dr. T. D. Davis, of Pittsburg, said that this question seemed unnecessary, but furnished much evidence to prove that it is a pertinent one. He referred particularly to the lack of organization, although there are societies of all sorts. An authoratative body is yet lacking.

**The Importance and Necessity of Industrial Hospitals.**—Dr. W. B. Lowman, of Johnstown, after an experience of sixteen years with such an institution, accords it hearty praise. By industrial hospitals he means those connected with manufacturing or industrial establishments containing large numbers of workmen that are liable to injury. They are intended to receive accident cases only. The one in question is maintained by the Cambria Iron Company. At first it had but 12 beds and during the first year it was used for 32 in-patients and 363 ambulance cases. There are now 40 beds and last year there were treated 604 in-patients and 3,104 ambulance cases. There are two points in its favor—it is just and humane to the men, and it pays as a business investment. The sooner accident cases are attended to the better for every one concerned. At the hospital everything needed in an operation is at hand. At a private house nothing is ready for the surgeon. Employees come to entertain a better opinion of their employer and thus is brought about a better understanding between capital and labor. Litigation is diminished. To organize these hospitals the business side of the question must be presented to the corporation. The humanitarian side has been too much emphasized. The average cost of the hospital mentioned has been 85 cents per patient per day.

**The Medical Expert Witness.**—Dr. G. W. Wagoner, of Johnstown, spoke of the difficulties besetting the expert medical witness and offered pertinent advice concerning his actions. The difference between a common and an expert witness is a great one, yet attorneys deny that experts are advisers to the courts. Hired experts give conflicting testimony and the truth is covered over, instead of being made clear. The jury throws all of the testimony out and experts are discredited. Another difficulty is that the courts do not distinguish between *physicians* as experts. Often no

classification according to school, length of time since graduation, etc., is made.

**Further Reflections on State Medical Board Examinations.**—In answer to criticisms, Dr. A. O. J. Kelly, of Philadelphia, reaffirmed his opinions as embodied in an article read at the meeting of 1902.

(To be Continued.)

## SPECIAL ARTICLE.

### BYWAYS OF MEDICAL LITERATURE.—XVII.

#### PULSE BEATS AND MUSICAL RHYTHM.

In the *Popular Science Monthly* for September there is an article on Pulse and Rhythm, by Mary Hallock, that is calculated to be of great interest to physicians. Miss Hallock calls attention to the fact that from the earliest times there has been an impression abroad in many minds that rhythm in music was somehow associated with the pulse beat of ordinary human existence. This idea has been repudiated as visionary, yet there would seem to be good basis for the idea in all kinds of music, the ultra-classical, as well as the most familiar melody, the most solemn church chants as well as the hackneyed rag-time.

The majority of Beethoven's sonatas, for instance, are written to a metronomic notation of 72 to 76 beats to the minute, almost exactly the average number of the human pulse in health. All of them are within the limits of pulse variation, written to metronomic notation of from 58 to 81, being exactly the limits of the pulse during the physiological rhythm of daily metabolism. Seventeen bandmasters, consulted as to the rhythm to which they kept their music, answered from 64 to 72 beats per minute, which corresponds closely to the average pulse rate and bears a definite relation to the fact that this is about the number of steps per minute that bodies of men take with least fatigue and with the greatest satisfaction. Both facts may then be unconscious tributes to the influence of the cardiac rhythm within making itself felt in brain processes.

The musically inclined will find by consulting their pulse beats that a whistling street-urchin or a jangling hotel piano is giving forth a succession of sounds, the emphatic notes of which correspond very closely with the pulse beats. The doxology and "Yankee Doodle," far apart as they would seem to be in musical and ethical relations, have the physical quality in common that the successive beats in the music follow one another at intervals of a second, thus corresponding to the pulse rate. On the other hand Chopin, of nervous temperament and suffering during the period of his greatest productivity in music from the slowly progressing pulmonary tuberculosis that eventually carried him off, wrote his great set pieces to a metronome running at over 80 per minute—thus reflecting perhaps his physical condition and the pulse beat in his cerebral arteries, which, in his condition, was constantly higher than normal.

Miss Hallock suggests that this correspondence of pulse beat and music rhythm may be really a case of cause and effect. The objection, of course, might be made that any such influence is entirely unrecognized, but it is well-known that factors, even of importance, constantly acting upon the senses may come to be neglected and the same thing may easily happen with regard to the arterial wave and its influence on the brain, yet the result of that influence be clearly manifest in some direct or indirect outcome of brain activity that occurs as a consequence. The whole question is one of those highly interesting physiologico-psychological problems that deserves to be studied more carefully than in the past, for it has within it the promise of interesting relationships hitherto unsuspected.

#### THE PHYSICIAN IN LITERATURE.

A number of young physicians have recently attracted attention by their success in the field of literature. One of the latest to come to the front is Dr. Archibald Stodart-Walker, rather well-known before this for his valuable investigation in psychology and neurology, published under the title of "Researches in the Reaction Time of Touch, Light and Thought" and his monographs on "Hysteria in the Male," "Hypnotism" and "Crime Habit and Control." It seems to be quite the proper thing for neurologists and psychiatrists to dabble in literature, and we have, of course, some distinguished examples on this side of the water. Dr. Stodart-Walker's first venture came many years ago when he was only a little over ten years of age, yet he assisted in editing and wrote, it is said, a number of the verses in the Scottish Students' Song Book. In recent years the doctor has been rather widely known to the literary world because to him was committed the preparation for publication of the Journal Letters and other remains of his gifted uncle, the well-known professor, John Stuart Blackie, of the University of Edinburgh.

Dr. Stodart-Walker's venture into the realm of pure literature is a book with the rather striking title "A Struggle for Success." The author describes it as a study in Social Compromise, Expediency and Adaptability. A recent critic in the Edinburgh *Scotsman* describes the book as striking but also alarming, in that the Doctor states so forcibly certain of the social tendencies of the time. Some of the Doctor's views in social affairs are conventional to a degree seldom expressed in print. This is especially true of his attitude as regards morals and marriage, and his description of hypocrisy of the present generation with regard to many of the things it is supposed to hold dear while nothing really counts for it in the struggle for success except the getting there at any cost. It seems not unlikely that Dr. Stodart-Walker's position as a neurologist and the closeness of his association with a large number of people because of his professional career has given him an insight into social conditions much farther below the surface than is possible for the ordinary man whose occupations rather take him away from the opportunities for such study.

Among the other distinguished Edinburgh authors of to-day is the daughter of the distinguished Sir James Y. Simpson of chloroform fame. Miss Eve Blantyre Simpson's name will be familiar to not a few American readers because of her book "Robert Louis Stevenson's Edinburgh Days." Miss Simpson is a great lover of the country and is devoted to animals, one of her most read books being "Dogs of Other Days." She has inherited not a little of her father's taste for scientific pursuits and her literary work has taken the form of studies in folk lore in the historical traditions and legends of Scotland and on these subjects she is a frequent contributor to the *Scotsman, Blackwood's* and *Chambers'* magazines.

A very recently published novel, by a medical author, that is attracting no little attention having, it is said, gone into its second edition before the announced date of its publication, is "The Third Degree," by Dr. Charles Ross Jackson, of New York city, though there is no evidence on the title page to indicate the fact that the author is a member of the profession. Novel readers who keep up to the times in fiction, and hard enough it is, will recall with pleasure one of the successful books of last year, "A Daughter of the Pit," written by Margaret Doyle Jackson, who is the wife of the

writer of the present novel. Mrs. Jackson's book published by Houghton, Mifflin & Company, went through a number of editions and received a full meed of praise from the critics of the country generally. Dr. Jackson's book, published by Dillingham, promises to be at least as great success, and will be an almost unique example of conjugal talent for novel writing developing on both sides, long after marriage. This is an interesting melodramatic story with a murder and poisoning case, the poisoning being done by one of the recently discovered synthetic products, whose name is concealed because the legal authorities of the story consider it advisable not to put such a dangerous weapon as this into the hands of the public. As the interesting fact is brought out, that when an alcoholic solution of the drug has dried in spots it may be made to detonate, the mystery is perhaps not so deep for those who are more or less familiar with chemicals. The story is a clever one and will doubtless have many readers.

### THE OUTLOOK IN SANITARY SCIENCE.

In an article in the *Booklover's Magazine* for August, 1903, on the lengthening of human life and the victories of modern medical science, Dr. Joseph Walsh, of Philadelphia, sets forth the promising outlook in sanitary science, especially with which the twentieth century opens. Scientific medicine is only in its infancy. Its progress will prolong more and more markedly the average age of life by removing the diseases that play havoc during childhood and adolescence. Cholera infantum, the terror of mothers during the second summer, has within the year delivered up its cause to a medical student, Duval, of the University of Pennsylvania, working under the direction of Professor Flexner. With the examples of Vienna and Munich before us, we realize the fate of typhoid fever, which proves the pitfall of many an ambitious adult. With typhoid will disappear its most notable sequelæ, gall-stones. Thumbs were turned down twenty years ago on the animal parasitic diseases, such as trichinosis and tapeworms, when the late Dr. Joseph Leidy, of Philadelphia, entered the lists and demonstrated how easily they might be conquered.

When the organisms themselves cannot be directly handled the source of contagion will be learned and the diseases thus avoided. Our now constant enemies, tonsillitis, influenza, and tuberculosis, will find it impossible to progress when people realize the uncleanliness of handkerchiefs and come to the use of paper napkins. Diphtheria and whooping-cough, and, probably other diseases, will have one source of contagion removed when pet dogs and cats are kept away from children or carefully held within doors. Inventions outside the problems of medicine will be by no means without influence. We have every reason to believe from analogy that flies are a frequent medium of transferring contagious diseases. Flies breed practically only in stables and the replacing the horse by the automobile means their extermination. In thus depicting the advance of medical science and predicting its ultimate triumph over disease are we anticipating a millennial condition? No, decidedly not. It is only a picture of the end of our present century when man will accomplish his four score and ten in comparative freedom from the disease hobgoblins of to-day. There are those who may think the prophecy too sanguine. Undoubtedly, however, if the promise of the last few years is fulfilled this much may be conservatively anticipated.

### A COUNTRY PHYSICIAN AND THE OPPORTUNITY.

A writer in the New York *Independent* calls attention to the fact that the Pope's physician, who has proved so capable under the trying circumstances of taking care of a nonogenarian, was originally only a practitioner in one of the country towns on the eastern coast of Italy. When the late Pope's preceding physician died there was not a large number of medical men from whom his successor might be selected. All the Italian medical men who are attached to the Italian universities have taken the oath of allegiance to the Italian government, which is considered to be a usurping government by the popes, and consequently are unavailable for the position. Dr. Lapponi, who was practising in a little town not far from Ancona, happened to have been called as the physician of a cardinal who was staying on the east coast of Italy during one summer for his health. The cardinal was very much taken with Lapponi's ways, and especially with his common sense views with regard to care and nursing, rather than drugs as the mainstay for patients advanced in years.

When Pope Leo was looking around for a successor in the office of papal physician this cardinal was very close to him in certain important matters of state, and was consulted with regard to the choice that should be made. He suggested the name of Lapponi and gave such good accounts of his success in his own case that without more ado Pope Leo selected him as his physician. To the surprise of the country practitioner there came to him one day a messenger from Rome with the formal document appointing him physician to the Pope. It was totally unexpected and came as a complete surprise. For a time Lapponi suspected that some of his medical friends might be playing a practical joke on him, but a little inquiry elicited the fact that the documents had come through perfectly regular channels. Lapponi made his way to Rome and was formally welcomed and installed in his position.

He proved in many ways to be the right man in the right place. Leo XIII had always been delicate, but that very fact had made him extremely careful with regard to his health and had made him very ready to follow the slightest suggestion of his physician. Besides he was a man eminently abstemious and not likely to go to excess in any way, except as regards the amount of work he would insist on doing. This was the one difficulty his physician had to encounter, and no directions, however positive, were sufficient to keep the Pope from overworking at certain times. Only once was there a decided difference of opinion in other matters between the Pope and his physician. Pope Leo had lost several teeth when he was considerably over eighty. One of the Cardinals suggested he might very well replace them by a set of teeth made for the purpose. The Pope announced one day to Lapponi that he was about to have himself fitted with a complete new set of teeth. His physician at once objected, and said that if His Holiness had a new set of teeth he would almost surely be tempted to eat things that would not agree with his old stomach. The Pope saw the wisdom of this, and did not get the teeth.

Many of the old nobility in Rome, who have remained faithful in their adherence to the Pope, became the patients of the new Papal physician. The medical men of Rome generally, however, were very ready to admit that Lapponi had not abused the prestige of his position, nor lowered its professional dignity in any way, and that he had indeed proven himself equal to the opportunity which had been so unexpectedly presented to him.

### MEDICINE IN SHAKESPEARE'S TIME.

In a recent number of the *Westminster Review* Dr. John Knott discusses the medical knowledge of Shakespeare. He says that not many allusions to the anatomy

and surgery of the skeleton are met with in the works of the great dramatist. He quotes two or three such references, however—one of which is of special interest. In the *Winter's Tale*, Autolycus calls out that he fears his "shoulder blade is out." Dr. Bucknill's commentary on this passage is an *ex cathedra* pronouncement that "the shoulder blade cannot be dislocated." On this Dr. Knott makes the interesting observation that "as in so many cases where commentators have undertaken to amend Shakespeare, the great poet is quite in accord with the most advanced knowledge of this subject in the present day, while the critic is absolutely wrong." Dr. Bucknill's mistake he attributes to the fact that in the ordinary text-books of the early portion of the last century dislocations occurring at the joint between the shoulder blade and the collar bone were always spoken of as dislocations of the clavicle, as the projecting extremity of that bone produced the resulting deformity. Of muscles as distinct entities in the human framework Shakespeare appears to have had no knowledge whatever; this is not surprising, as the Italian universities were then the only places in which anatomy was systematically studied. Shakespeare's vague use of the terms "nerve" and "sinew" show that he shared the indefinite ideas of his time. Hazy ideas of the circulation had existed among anatomists and physiologists before Harvey was born; and several passages of Shakespeare seem to Dr. Knott to show that Harvey's discovery, which was published after his death, would not have been a startling novelty to him if he had lived. The most definite expression on the subject he finds in *Coriolanus*, in the famous parable of the belly and the other members of the body. The stomach, after describing itself as the storehouse of the food received into the body, says:

I send it through the rivers of your blood,
Even to the court, the heart, to the seat o' the brain;
And through the cranks and offices of man,
The strongest nerves and small inferior veins
From me receive that natural competency
Whereby they live.

"If," says Dr. Knott, "this passage does not indicate a distribution of the pabulum by the circulating fluid to the various tissues of the body, distinctly foreshadowing the outline of what is known at the present day, I cannot suggest any other interpretation." After citing a number of instances of Shakespeare's references to matters connected with medicine, Dr. Knott justly points out that medical knowledge in the strictest sense did not exist in Shakespeare's day. "But when it comes to description of symptoms which may be observed at the bedside of the sick or dying, and which, the human organism being the same then and now, are familiar to every practising physician, we find them recorded by the dramatist with a vivid accuracy which cannot be surpassed." Dr. Knott's paper is an example of the blending of medical knowledge with literary taste which we are always glad to welcome in the members of our profession. Literature of the right kind enlarges and deepens human sympathy, which is apt to become shriveled and hardened if exposed too exclusively to the dry light of Science.—*British Medical Journal.*

## BOOK REVIEWS.

Studies in the Psychology of Sex. Analysis of the Sexual Impulse; Love and Pain; the Sexual Impulse in Women. By Havelock Ellis. F. A. Davis Company, Philadelphia.

The author is recognized as one of the most able and careful students of the subject of this small volume. He is sound and thoroughly acquainted with an extensive literature that is neither prurient nor obscene

He here presents three studies, parts of which have appeared in other places, all of which are worthy of study by those called on to deal with problems of sex, and what physician is not?

The analysis of the Sadistic and Masochistic phenomena is especially able and thorough.

These books are not for general reading, but they are valuable to the true student.

International Clinics: Quarterly of Illustrated Clinical Lectures and Especially Prepared Original Articles on Treatment, Medicine, Surgery, Neurology, etc. By Leading Members of the Medical Profession Throughout the World. Edited by A. O. J. Kelly, A.M., M.D., Philadelphia. Volume II, Thirteenth Series, 1903. J. B. Lippincott Company, Philadelphia.

This second volume of the International Clinics under its new editor fulfils the promise of its predecessor. There is an excellent symposium on the summer diarrheas of children, which begins with a biological discussion of milk bacteria and intestinal disorders by H. W. Conn, of Wesleyan University. Among the important articles of the volume may be noticed "Practical Notes on the Prophylactic and Curative Treatment of Influenza, Malaria, Erysipelas and Ozena," by J. McFadden Gaston, of Atlanta; "The Rest Treatment, When Indicated and How Conducted," by J Madison Taylor, of Philadelphia; "The Etiology, Prevention and Treatment of a Common Cold," by Alexander Haig, of Edinburgh, Scotland, and the "Causation and Treatment of Sterility in Women," by Dr. J. Riddle Goffe, of New York City.

On Syphonage and Hydraulic Pressure in the Large Intestine with Their Bearing upon the Treatment of Constipation, Appendicitis, etc. By Ralph Winnington Leftwich, M.D., Late Assistant Physician for the East London Children's Hospital. Author of "An Index of Symptoms," etc. William Wood & Co., New York.

Dr. Leftwich has conceived the idea that the large intestine works on the principle of the syphon. The first paragraph of the book is as follows: "Many centuries have passed since the large intestine was described and many thousands of anatomists have examined it closely.' Among them some must surely have marveled that a mechanism so ill-adapted to an erect being could do its work so well. There is a key to the problem, but without the key nothing could well appear more faulty than the design." The key, according to Dr. Leftwich, is the fact that the long arms of the ascending and descending colon act as a syphon. The new theory has some interesting practical features that are well brought out.

## BOOKS RECEIVED.

*The* Medical News *acknowledges the receipt of the following new publications. Reviews of those possessing special interest for the readers of the* Medical News *will shortly appear.*

Text-Book of the Diseases of Women. By Thomas A. Ashley, M.D. 8vo, 661 pages. Illustrated. Williams & Wilkins Company, Baltimore.

Manual of the Diseases of the Eye. By Charles H. May, M.D. Third edition. 12mo, 408 pages. Illustrated. Wm. Wood & Co., New York.

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